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Psychological Bulletin

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CONTENTS

Proceedings of the Eighteenth Annual Meeting of the Southern Society for Philosophy and Psychology, Nashville, Tenn., March 30 and 31, 1923. O. R. Hughes, *Secretary*, 417.

General Review: Recent Work on the Psychology of Forming Concepts, W. Eliasberg, 427.

Discussion: Neurology: Mystical and Magical, H. C. Warren, 438.

A Simple Barrier for the Ears, C. A. Ruckmick, 443.

Special Reviews, 444–480.

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THE PSYCHOLOGICAL BULLETIN

PROCEEDINGS OF THE EIGHTEENTH ANNUAL MEETING OF THE SOUTHERN SOCIETY FOR PHILOSOPHY AND PSYCHOLOGY, NASHVILLE, TENN., MARCH 30 AND 31, 1923

REPORT OF THE SECRETARY-TREASURER, OWEN R. HUGHES, WEST TENNESSEE STATE NORMAL, MEMPHIS

The eighteenth annual meeting of the Society was held at Vanderbilt University and George Peabody College for Teachers, Nashville, Tenn., Friday and Saturday, March 30 and 31, 1923. The Friday sessions were held in Furman Hall, Vanderbilt University, and the Saturday sessions in the Industrial Arts Building and in the Jesup Psychological Laboratory of Peabody College.

Chancellor Kirkland of Vanderbilt made a brief address of welcome.

The meeting of the Council was held at 5 P.M. Friday afternoon, Dr. H. C. Sanborn, the President, presiding.

The following officers for 1923–24 were nominated: For President, Dr. Buford Johnson, Johns Hopkins University; for Vice-President, Dr. J. F. Dashiell, University of North Carolina; Members of the Council for three years, Dr. H. C. Sanborn, Vanderbilt University, Dr. J. B. Miner, University of Kentucky.

The following were nominated for membership in the Society: Mr. S. Isaacs, Johns Hopkins University; Mr. J. Q. Holsopple, Johns Hopkins University; Dr. J. C. Sprowls, University of Tennessee; Dr. Ellis, University of Tennessee; Miss Karlenkark, Columbia, Tenn.; Miss Helen Gamble, Maryville College, Maryville, Tenn.; Dr. Taeusch, Tulane University; Dr. H. W. Crane, University of North Carolina; Dr. F. A. Allport, University of North

Carolina; Dr. M. R. Trabue, University of North Carolina; Dr. Mabel Gouge-Crane, University of North Carolina; Dr. Bailey, Sewanee University; Miss Georgene Hughes, Louisiana State Normal; Prof. Robert L. Bates, Virginia Military Institute; Prof. P. F. Finner, Florida State College for Women; Miss Alice Wildman, Mississippi State College for Women; Mr. W. J. Woodson, Peabody College.

Invitations for the next meeting were extended from Johns Hopkins University, Peabody College, University of Georgia, Virginia Military Institute, Chattanooga Chamber of Commerce, Louisville Chamber of Commerce. The selection of a meeting place was referred to the regular session. A motion was passed that persons submitting papers for the program be requested to send to the Secretary, prior to the meeting, abstracts of papers to be presented.

At the general session on Saturday morning the following items were passed upon: 1. All nominees for office and for membership in the Society were elected, and Dr. Josiah Morse of the University of South Carolina was elected to fill the unexpired term of Dr. Dashiell on the Council. 2. The invitation of Dr. Knight Dunlap to hold the next meeting at Johns Hopkins University was accepted. 3. Suggestions for the program were called for and it was recommended that the Council should arrange for one half day's discussion on The General Relation of Psychology, Religion and Philosophy at the next meeting.

OWEN R. HUGHES,
SECRETARY-TREASURER

Memphis, Tenn.

ABSTRACTS OF PAPERS

A Test of Moral Judgments. W. J. Woodson, State Teachers College, San Marcos, Texas.

A group test with 34 different forms of behavior, generally conceded as bad, was given to 231 rural teachers and college students. The lost was varied from the smallest offense to the worst crimes, and it was made concrete by having a brief description of the person concerned and the incidents leading up to the act committed. The method called for (1) absolute evaluation of the acts by a distribution over columns designating various degrees of wrong, (2) relation of offenses by having them ranked.

The judges, or subjects, were divided into groups as to age, sex, religion, etc., and their agreements and disagreements analyzed.

Results indicate that (1) women condemn wrong conduct more severely than men do, as they evaluated 26 of the 32 bad acts worse than the men did; (2) women condemn special types of behavior as sex immorality, breaches of social customs, and behavior not amenable to law, more than men do. The widest sex difference on any single act was in the women condemning the immoral girl; (3) men condemn more perjury, arson, bribery, and acts in general against which there are severe penalties; (4) young people are influenced by the effect behavior has on social standing and older people more by the severity of the penalty; (5) the most critical group are the rural female teachers from twenty-three to twenty-eight years of age, and the acts they especially condemned are sex immorality, Sabbath desecration, and dishonesty in business transactions.

Correlations on ranking ranged from .86 to .97, being the lowest between the women twenty-three to twenty-eight years of age and the men twenty-nine to fifty-five years of age.

A Comparative Study of Athletic and Nonathletic College Students In Tests of Strength and Coördination. Buford Johnson and Roy M. Dorcus, Johns Hopkins University.

The subjects were 20 men on the track squad and a control group of twenty men who do not take part in athletic activities. The tests used were the steadiness, tapping, dynamometer, color naming, and two forms of coördination.

In summarizing the results, we find:

1. That the athletic group is superior to the nonathletic group in the tests used, except one. In the steadiness tests Nos. 7 and 10 the nonathletic group has an advantage, though the difference is not quite twice the probable error. In all the other tests the nonathletic is inferior and if we consider the differences in averages which are significant, we can see from D/P.E.D. that the athletic group gives a significant superiority in dynamometer test, coördination tests J and D, and the card sorting test.

2. That there is some characteristic difference between the ability to inhibit action entirely and to control action, once started. This is brought out in the Steadiness Test, in which the nonathletic group shows the superiority while the athletic group, in the coördination tests, gives the best performance.

3. That there are certain types of fatigue curves as shown by the dynamometer test, namely: (a) the maximal grip at the beginning with a steady decline and very slight recoveries; (b) the maximal grip at the beginning with many fluctuations, the recoveries coming back almost to the same level throughout; (c) the maximal grip at the beginning with varying fluctuations and increase towards the end; (d) the grip that is maintained at the same level throughout.

4. That there are at least significant positive correlations in several of the tests, *i.e.*, No. 7 and No. 10 steadiness tests, card dealing and color naming, and the coördination and steadiness tests.

Academic Recognition and Organization of Psychology as a Department of Natural Science. J. F. DASHIELL, University of North Carolina.

Although psychology as a field of research and of practical application is clearly recognized as a natural science, as a field of teaching it remains still ancillary to philosophy or to education. This situation is disadvantageous academically in several ways. Its correction would take the form, primarily, of the establishing of a separate department of psychology and its alignment with the natural science departments; secondarily, of the reorganizing of courses to conform to the spirit of natural science teaching. This involves the introduction of a definite amount of laboratory and observational work in the introductory course and in greater or less degree in all other courses. The concrete phases of psychological study should be central, not purely incidental to arm-chair methods.

A Measurement of the Ability in English of a Freshman Group in College. J. B. MINER, University of Kentucky.

Starch's Grammar Scale A, Grammar Test 3, and punctuation tests were given to 494 freshmen in the English classes and the results compared with data from Wisconsin high schools, freshmen in the University of Washington and juniors in the University of Wisconsin. The results showed that these college freshmen were approximately like the sophomores in high school in these English tests. The difference from the high school seniors amounted to about seven times its error. Moreover, these same college freshmen average on the Army Alpha test about the same as corresponding freshmen in Wisconsin. This seems to indicate that the deficiency in English, as reached by these tests, is to be explained by school and home training rather than by any difference in the capacity to learn English.

Analyses of Study. A. S. EDWARDS, University of Georgia.

Among several types of investigation upon the problems of study the writer has tried to learn the details of procedure of students in studying; this has been done both in the laboratory under strictly controlled conditions, and also outside the laboratory under the conditions of study customarily existing for students.

Report was made mainly upon 260 analyses made by 26 advanced students, juniors, seniors and graduate students, in the advanced laboratory class at the University of Georgia. Material used for study included historic and scientific prose, poetry, objects, mathematics, and foreign languages, regular university assignments and selections made by the students.

With the exception of prose and mathematics there seems to be little idea of definite purpose for study of various types. The study of poetry and objects was most difficult and found to be most varied in procedure. Outside of a few rather obvious things, the study of different individuals was characterized by great variety of things done. If we may say that there are in general some fundamental principles of study recognized and followed by students in historic and scientific prose, it seems even more true that there is lack of anything at all like system in the study of objects and poetry.

Taking into account also the work of students who studied in their customary places we may say that there appears to be a certain amount of method of procedure in studying, but in a limited way,

e.g., in connection with reading and rereading, attempting to select main points, to understand and to memorize. Otherwise procedure is haphazard and seems to depend upon chance and the particular suggestions of the subject of study.

The Psychological Corporation. JASPER C. BARNES, Maryville College.

The Psychological Corporation was incorporated in New York in 1921. The objects of the Corporation are the advancement of psychology and the promotion of its useful applications. The central offices of the Corporation are in the Grand Central Terminal, New York City.

The stock of the Corporation is held by active psychologists, and it may be taken over by the American Psychological Association on payment of one hundred dollars per share. No dividend in excess of six dollars per share may be paid during any calendar year.

The Psychological Corporation proposes to give tests of general intelligence, the mental age of children, the qualifications for entrance to high school and college, clerical ability, musical talent, memory, and a general psycho-physical examination.

The Corporation is controlled by twenty directors who are psychologists of national and international reputation. The president is J. McKeen Cattell. Branches have been organized or are being organized in fifteen states and in the District of Columbia. The future of the Corporation rests primarily on the branches and the stations that they organize.

The Utility of Social Nuisances. KNIGHT DUNLAP, Johns Hopkins University.

The Function of Philosophy in Religious Orientation. CLIFFORD G. THOMPSON, Emory University.

The position taken in this paper was that the study of philosophy performs an important function in education in that it gives the student his bearings in life. In his study of religion the student of philosophy is able to justify it as a reasonable attitude for a reasonable being. Philosophy is able to offer the strongest apologetic for essential religion, because it takes the position that the nature of the universe sustains and justifies the religious attitude. Faith is not the acceptance of creeds but the venture of life. The study of philosophy tends to unify life and experience, and so tends to make

the venture of faith a rational attitude. This means that philosophy does not try to establish the truth of any religious notion that has not justified itself in the conservation of socially recognized values.

PRESIDENTIAL ADDRESS: *Esthetics and Civilization.* H. C. SANBORN, Vanderbilt University.

The problem of esthetic education is one that was first emphasized by Plato in connection with his description of an ideal society in the "Republic" and was then discussed by Aristotle in the "Politics." Neither of these contributed much to its solution, because of their inability to isolate the esthetic function, their general lack of a dynamic psychology leaving them without a proper concept of creative imagination. Not until the analysis of Kant was the esthetic element clearly distinguished; and then the problem of esthetic education receives its classical discussion by Schiller on the basis of the Kantian philosophy.

Schiller's discussion receives its impetus from the situation of Europe in 1795, in view of the aftermath of the French Revolution. It revolves about the development of true political freedom which is for him the highest work of art, dependent in the last analysis upon the attainment in the individual of poise and balance. This is a result not of rational, radical revolution, but may be secured only by means of a slow evolution through the influence of true or ideal art, itself "the daughter of freedom." The tradition of Plato, Aristotle, and Schiller has persisted in Germany and gave rise at the turn of the century to a systematic attempt to realize it, based upon psychology, anthropology, experimental pedagogy, history of art, etc., which seems worthy of serious consideration at the present time in view of political and social conditions which apparently represent, particularly in America, a much exaggerated 1795.

Conflicting Philosophies in Education. RALPH E. WAGER, Emory University.

Attention was called to the opposing views concerning mental tests as held by the protagonists of the doctrines of determinism, or necessitarianism, on the one hand, and those of the exponents of non-determinism, or non-necessitarianism, on the other. It was pointed out that the former held to the supremacy of Nature, and the effect of Nurture as of little or no consequence; that intensities of the psychic life are modifiable only through the operation of the

biological laws of inheritance; that measures of this psychic life are at hand in the form of mental tests. The latter deny the supremacy of Nature and maintain that Nurture is likewise potent; that modifications in many essential elements of psychic life are possible through its influence; that the scaling of psychic intensities is impossible.

The educational implications were pointed out, and emphasis placed upon the notion that the scientific bases upon which either view is developed must be accepted with reservations. This led to the point of the paper: the danger of setting adrift in the schools a group of six-weeks trained (?) testers whose "cock-sureness" in the efficacy of their tools assigns children to groups for specialized vocational or educational training, quite unmindful of the multiplicity of factors involved, and of the dangers which inhere in the process. No charge was laid at the door of the psychologist, but rather at those who abuse the instruments they have devised.

Norms for Nystagmus and the Perception and Illusion of Motion. S. ISAACS, Johns Hopkins University.

Effects of Duration and Direction of Rotation Upon Nystagmus. KNIGHT DUNLAP and J. Q. HOLSOPPLE, Johns Hopkins University.

Correlations Between Grades and Times of Writing on Informal Quizzes. KNIGHT DUNLAP and E. W. ATKINS, Johns Hopkins University.

The Use of a Common Unit in the Measurement of Race Differences. JOSEPH PETERSON, Peabody College.

This paper reports a number of results and conclusions of a research aided by a grant from the American Association for the Advancement of Science. A more detailed report in the form of a monograph is now in press.

In connection with the present paper a mimeographed table was distributed showing the results of all the quantitative researches on the comparative abilities of white and negro children and adults. Negro efficiency in this table is shown in terms of I.Q. with white children as standard; of difference between the medians of the two comparable race groups, the difference in every case being stated in

quartile or P.E. units of the white population thus permitting an approximate statement of the percentage of whites surpassing the median of the negroes; and, in a few cases, of the per cent that the median negro score is of the median white score. It is pointed out that a negro median of say ¾ the white median does not necessarily mean that the negro abilities measured are only ¾ as great as are those of the whites, the interpretation in terms of ability depending on where the zero point of ability lies. The practice by certain writers of reading the percentage of the negro median of the white median as percentage of ability is regarded as unfortunate. Taking all the evidence into consideration the conclusion is reached that the negro I.Q., under the conditions of the tests by various investigators as well as by the writer, lies somewhere between .75 and .80. This relates, of course, strictly to the negroes as now found in the United States. Stated otherwise, and probably by a better method, the difference between the medians of the two races is approximately 1.4 P.E. units of comparable white distributions. This means that about 83 per cent of the whites surpass the median of the negroes. Curves of distribution, which were shown, make it clear, however, that even if this difference proves to be about correct, 15 to 18 per cent of the negroes are better than even the median white, and a number of them are about equal to the best whites. Certainly no scheme for a different education of the two races is justified by these results, although the differences found are considerable, but rather the results show that in each race education must be fitted to the individual abilities.

There may be, and probably are, traits in which the negroes have the advantage; studies have usually been based on tests that stress too much the abstractions of conventional school work. So-called qualitative differences were found to be in many cases unreliable or probably so; it is suggested that hereafter all such differences be stated in quantitative terms, not merely in "better than" or "inferior to" terms. Comparisons of negro scores with those of whites of different sections and different school systems show that certain "qualitative differences" are not constant. Certain other differences, however, seem to be reliable.

The interpretation of score-differences found needs to be carefully done, and understatements of differences are better than overstatements because of harm that the latter may do to the race already seriously handicapped in its own development.

Value of Army Alpha in Predicting the Scholarship of Engineering Students. J. B. MINER and GLADYS M. LOWE, University of Kentucky.

This study was an attempt to discover the relative prognostic value of the scholarship received the first semester of the freshman year and the score on the Army Alpha test. The Army Alpha was given to 144 freshmen and 46 senior engineering students at the University of Kentucky. For the seniors the range was from 95 to 187, with a median score of 141; for the freshmen it was from 69 to 180, with a median of 130. In making comparisons with other institutions it is important to note that all scores at Kentucky were adjusted to Form 7, the most typical form.

Using Pearson's coefficient, the correlation between Army Alpha scores for 41 seniors and their first semester freshman scholarship was .14. The correlation between the Alpha score and the full scholarship records to the last semester of their senior year, exclusive of the first semester in college, was .39. This increase in correlation between the test and later records of scholarship has been seldom found, mainly because the same group was not used in other studies in making the comparisons.

The relation of the partial correlations .55 to .38 shows the relative importance respectively of the factors of first semester scholarship and Alpha scores in full scholarship.

The correlation between full scholarship and the combined scores in Alpha and the first semester freshman scholarship was .62. Tables were shown for comparison of test medians and correlations obtained at other colleges.

GENERAL REVIEW

RECENT WORK ON THE PSYCHOLOGY OF FORMING CONCEPTS

With special reference to Ach, *Ueber die Begriffsbildung* (1)

BY WLADIMIR ELIASBERG[1]

I

In the history of the investigation of concept-formation two questions stand out prominently: (1) What is the conception in its logical structure? and (2) Under what psychological conditions is it realized? To which may be added the subordinate question: How are concepts obtained in the course of individual development, and possibly also by comparative methods?

Up to the present the methods used in investigating concepts have taken into account almost exclusively the relation of concept to the meaning of words. Ach also sets himself this problem, and investigates the conscious realization of the significant meaning of a word as a sign or symbol in comprehending speech.

In regard to his method we shall follow the outline with which he prefaces his own investigation.

(A) *The method of establishing the phenomenology of the consciousness of meaning.*

The classical method is Galton's (7) method of reproduction. To achieve a unity of meaning in the procedure, the instruction demands the quickest possible reaction. Yet as a rule many different forms of behavior appear with this instruction, as shown by Lange in his reaction-experiments and by Meumann (12) in his experiments dealing with association.

With a different "set" a totally different qualitative course of meaningful experience takes place. This leads to a predetermined abstraction or apperception, in which the content of meaning may be looked upon as the after-effect of the previous "set."

Furthermore a general objection to the association-experiment can be raised on the ground that the consciousness of meaning is

[1] Translated from the original German by P. J. W. Pigors; edited by R. M. Ogden.

always determined apperceptively in a manner beyond the insight of the experimenter. This objection also holds for the experiments of Bühler, (4) who tried to secure the necessary uniformity of meaning by increasing the difficulty of the task. A further objection to Bühler's experiments is that his investigations do not permit of quantitative gradation. An improvement, however, is found in the method of tied associations used by Watt,(17) Messer,(11) Münsterberg,(15) and others, since this method naturally narrows the range of thought as compared with free association. Nevertheless there always remains the objection that, since the material deals with meaningful words, these experiments, for this very reason, can not exclude the possibility of apperceptive determinations.

Ach, quite rightly as it seems to me, leaves Koffka's investigation (9) out of account; for although Koffka's study offers very interesting phenomenological results, it is subject to almost all the errors that cling to the method of systematic experimental introspection. Koffka's method narrows the problem as much as possible, so that a single explanatory determination of the course of thought is rejected, and the work carried on almost exclusively with meaningful material. The method demands from the outset a record of the introspections, but there is nothing to indicate what the course of thought might have been if no introspection had been asked for.

Ach in turn consciously faces the demand for a completely analytic isolating order of investigation. The conditions under which a word or a symbol is forced to take on a significant meaning must be those of the experiment. The method of procedure must therefore be at once genetic and synthetic. In agreement with G. E. Müller, Ach also points to the fact that this should create the most favorable conditions for introspection, since on the one hand the isolated experiences are in the focus of attention, and on the other hand there is no possibility of producing what Müller calls images of functional uncertainty.

(B) *The methods of investigating abstraction in their relation to the analysis of concept-formations.*

Of no immediate connection are the experiments of Külpe, Grünbaum, Habrich, and Künberg, since they do not consider the question of the consciousness of meaning. But the work of such men as David Katz,(8) Moore,(13) and especially Achenbach,(2) is of interest. Achenbach offered his subject a nonsense figure and after a pause a square containing four figures. The subject knew

that the first figure had to be identified with one of the latter four according to its form, inasmuch as the size, position, and color of the repeated figure might vary. Achenbach then found that the first figure underwent change through a series of interesting and well-characterized technical forms resulting in a conceptual comprehension which generalized its partial contents.

Ach criticizes Achenbach's method because it does not sufficiently emphasize the functional meaning of the concepts—an objection which perhaps is not altogether justified since Achenbach again and again emphasizes and analyzes the formation of a purpose as important for the comprehension of the figure, even though this purpose is not the same that individuals employ in understanding one another's communications.

The difference in comparison with Ach's method rests rather in the fact that Achenbach is prone to rely upon explanations in terms of the association-theory, whereas Ach is interested in the phenomenology of the meaningful connections themselves. Ach finds this functional moment emphasized in a manner agreeable to his point of view by Köhler's recent investigations on apes. (10)

As to the method of Aveling (3), who exposed groups of pictures belonging to a definite field together with nonsense syllables, one might object that it demands introspection from the outset, thus effecting a complete change in the phenomenology of the consciousness of meaning, as will be shown in the course of this paper.

I will mention one other piece of work, by Siegfried Fischer (6), who also carried on a series of experiments using nonsense material with the definite purpose of investigating the evolution of the understanding of names. His results agree to a large extent with those obtained by Ach, even though his instructions are objectionable in the sense that from the beginning he presents the nonsense symbols as names. Nevertheless his records clearly show the difference between the name-experience and association.

(C) *The importance of tests of intelligence whose value lies mainly in comparative intelligence.*

Reference is here made to the works of William Stern (16).

II

Ach's methods of investigating the attachment of meaning are: (A) the method of search (S.M.); (B) the method of comprehension; and (C) the "store-house" experiment.

(A) In S.M. two large and two small cubes, two large and two small pyramids, two large and two small cylinders, were employed. Of the large objects one was heavy, the other light. The same was true of the smaller ones. The heavier objects were unequal in weight, which was also true of the lighter objects. The three large heavy objects were labeled *GAZUN*, while the three large light objects were labeled *RAC*. The three small but heavy objects were named *TARO* and the three small light objects *FAL*. All the objects were identical in color.

In order to make further differentiations one could use 12, 24, or 36 objects, identical in construction and marking, but different as far as color was concerned. Care was then taken that no associative connections could be made on the basis of the spatial arrangement of the identically colored and differently colored objects. In the first place an associative connection between the obvious characteristics, namely, size and weight on the one hand, and the names on the other, was made in the practice-period. In experiments with children of pre-school age the names were given orally instead of by having the child read the letters.

The labels weere omitted in the period of search, and the subject was instructed to find the object to which the name in question had been affixed. The subject was also informed of the success or failure of his efforts.

In the third part of the experiment, the test-period, a series of questions brought out the meaning which the subject had associated with the syllables; for instance a question like "How do *RAC* and *GAZUN* differ from one another?" Before the search-period such a question was answered as follows: "*GAZUN* is a word of two syllables and *RAC* is a word of one syllable."

It was characteristic of answers given after the search-period that they no longer pertained to the differences of the syllables as such, but to the differences of the objects.

Space does not permit a review of the interesting records made by adults of various degrees of intelligence, by school children, and by children of pre-school age, as data of comparative psychological value. The more important general differences were as follows: At first the subject worked in the search-period with visual images which later reappeared whenever the difficulty of the problem increased. The subjects first employed the criteria of perception, that is, they convinced themselves in every case by reference to the visual impression, etc., whether the problem had been solved success-

fully. To this, help-criteria were added in a definite order, especially those of counting and, finally, certain orders of arrangement. These arrangements as a rule were voluntarily employed even by children, and usually in such a manner that the arrangement of the previous stage became the differential criterion for the succeeding stage. Stage I contained two factors—size and weight; stage II added color; and stage III, form. Each of these stages had its own functional meaning for the solution of the problem. For the practice-period this is obvious. In the search-period the influence of successive attention was observed, that is, the effect arising from judgments of right or wrong. It is of pedagogical importance to note that in trials without a search-period it took a great deal longer for the association of the word with the main attributes of the object to become established. I shall not go into the psychology of the practice-period. The facts observed in this connection with regard to complex formations, and to coherence of similars, and also the not uninteresting results of the convergence of various weight impressions toward a median impression of absolute weight, have been partially described in previous investigations by writers of G. E. Müller's school. I shall confine myself to points of especial interest in connection with the formation of concepts.

In considerating the functional moment in the search-period Ach finds that his theory of determining tendencies is substantiated. To be sure, he formulates the determining tendencies a little more generally than he did in his *Willensakt und Denken;* for they are now regarded as influencing mental action in the sense of an ideational goal. "All objections to the determining tendencies on the ground that they do not also take into account the consciousness of meaning, but rather assume this important problem as already solved in some implicit manner, are erroneous," he writes.

Under the influence of the determining tendencies upon the solution of the problem and upon the material placed at the disposal of the subject by practice, new object-ideas are created; for instance, the object-idea of a large heavy body named *GAZUN*. The essential thing in regard to these object-ideas is that they do not coincide with the test-object, as such, but refer only to the common partial contents observed.

I wish to call attention to the fact that Ach's theory of object-ideas is formulated with respect to common partial contents, although relations can, of course, become objects of abstraction without ever having been partial contents—as, for instance, in the case of a hypo-

thetical relation, or the relation *per exclusionem*. The abstraction or the construction of object-idea according to Ach seems to take place in the form of a judgment, and as an accompanying phenomenon, that is, as a means to the accomplishment of a practical aim—but never as an aim in itself. This tendency to form object-ideas is reënforced by the psychological fact of convergence; that is, the particular change in mental elements by means of which they approach a median value, in support of which I refer to G. E. Müller (14).

Whatever rôle the ascription of meaning plays in this whole process cannot be shown by the S.M., for this method has to figure from the outset with what Koffka calls latent signifying tendencies. From the beginning there is a tendency to comprehend syllables associated with the object as names. How effective this naming-tendency is from the beginning is indicated very characteristically in experiments upon the solution of arrangements where the syllables were placed upon the " wrong " objects. Here two possibilities might be expected: the subject might perceive the disturbance either of the relation between name and object, or, of the relation between the various attributes of the object. It was very significant that scarcely any of the subjects, including the children, hit upon the idea that the labels might have been changed. They believed rather that the objects marked *GAZUN* were still the same, but that the weight had been taken out of them. The reason for this must be sought in the explanation of the formation of object-ideas.

The exclusion of signifying tendencies delimits the experiments as modes of understanding in which certain forms of non-sense syllables; for instance, single syllables beginning with a consonant were associated with certain other syllables in the practice-period. To the syllables *BIFAN* single syllables were added, always beginning with a consonant. The series to be learned each consisted of two prefixes with four suffixes, and also at the end a pair of syllables whose prefixes were formed like the other prefixes, but to which the same suffix was always added. As can be readily understood, a naming-tendency is not effective in this experimental arrangement, in the case either of optical or of oral presentation. This, of course, has been established by Müller's experiments with the hit-or-miss method. One syllable is never comprehended as the name of another. The essentials of this method were to produce experimentally an intrinsic ascription of meaning and to determine the nature of the experiences that took place. After practice the subject was asked to name the missing syllable in an incomplete complex as

briefly as possible so that the experimenter could supply it to him. Several subjects with whom the series had been carried out with introspective records from the beginning, and who were consequently used to describing their experiences of meaning in a rapid manner, actually named the class of the missing suffix by the prefix syllable; so, for example, if a single consonant syllable was missing: "I lack a *BIFAN*." Other subjects in trying to solve this problem were at once reduced to doubt and uncertainty.

The constantly repeated injunction to express oneself as briefly as possible led to a recounting of the attributes which the missing syllable must have, and only after a hint to remember the practice-experiments did there come a kind of "Aha-experience" (4) markedly pleasant, to which with assurance the prefix was then added for the desired purpose. It was not yet a class-concept, however, but at first only a volitional single-word sentence. From now on *BIFAN* meant to the subject: "Give me a syllable that belongs to the *BIFAN* type." Only the further stages of understanding in the form of question and answer permitted the development of a general conception of "class." Ach points out that this "Aha-experience" of insight bears a close resemblance to the well-known "water experience" of Helen Keller. The difference, perhaps, lies only in the fact that with Helen Keller this was her very first name-experience, whereas to the subjects of these experiments the function of naming was, of course, long since familiar.

What, then, is the nature of the functional connection that appears as something new in this method of understanding? As in the case of the method of search a new object-idea must be formed at the start—as, for instance, of the end-consonant of the syllable. But now, over and above the mere associative connection, it becomes a case of identifying the object-idea with its name as a fused unit. A necessary presupposition for this fused unit is that the perception of the elements retreats with the appearance of what Ach has previously called a *Bewusstheit*, an existential non-perceptive knowledge. That this non-perceptual development can be destroyed by too strong an associative connection, or by too energetic practice, is, of course, obvious, and is noted by Ach.

Let us pause for a moment and consider once more the rôle of the *Bewusstheit*. Its functional meaning is to give as far as possible a "non-perceptual" representation of the object-idea by creating an "ideal object." The *Bewusstheit* must be limited in two directions; for it is not an abstraction in the sense of emphasizing the inde-

pendent or dependent partial contents of one or more objects, since it can also represent something individually non-perceptual; nor is it to be mistaken for the functionally uncertain images of G. E. Müller, since it represents their opposite. The *Bewusstheit* has definiteness of content, but indefiteness with regard to the object, whereas functionally uncertain images are definite with regard to the object, but visually indefinite with regard to their content.

Abstraction in a true sense is not furnished by the *Bewusstheit*, yet with the disappearance of perceptual moments greatly influenced by the imaginal type of the individual, the representations of different persons approach one another for purposes of understanding. Thus *Bewusstheit* or the "ideal object" furthers the general validity of common thought between individuals though it does not furnish conceptual generalizations. If, therefore, the intrinsic experience of meaning arises from the fused unity of an ideal object and its symbol, we see at once that the customary designation of words as symbols is wrong; for the word designates the object only in so far as the object is present as a *Bewusstheit*, even though it is not perceived. Only in so far as the object is really present in this sense does the word mean anything to us. In addition to the intrinsic ascription of meaning, meanings are conferred by the aid of practical judgments in naming, and also, as stated above, by means of latent signifying tendencies, (this form mainly in science). That the associative connection as such is not identical with naming follows directly from the reports of observers who experience these signs, sometimes as names, and again only as "*indices.*"

We have seen that in certain functional connections (situations), as, for instance, in understanding, the formation of concepts can result from naming. The problem is now to find an experimental way of generalizing concepts. There are three possible ways of generalizing psychological conceptions: First, by means of impoverishing the content; thus the first concepts of *LARUP, BIFAN* were subsumed under a higher concept by means of an intrinsic ascription of meaning. Secondly, through changes in the use of the object; the experimentally created concepts of *GAZUN*, etc., at first meant only the objects being experimented with. In a specially arranged visit to a store-house the concepts previously gained were extended so as to include all heavy bodies in general. The extension was secured in this way: foreign objects were added to the original objects of the laboratory experiment—as, for instance, large and heavy non-colored objects such as cigar-boxes. The psychological

field of validity of the concept depends not only on its content, but also on its empirical use. Only by means of the store-house experiment did the subject succeed in experiencing the object independently of use and solely as defined by its attributes.

Finally, a third extension of the generalizing experiment was made, which is also of practical importance, and which similarly has nothing to do with content impoverishment. This was the extension in a circle of people using the same concepts.[1] Since the individual experiences of various persons differ, so the naming and communication of their experiences provide a further method of generalizing the concepts, just as in the case of the store-house experiment the use of the object was extended for the individual subjects.

We shall omit Ach's comparative psychological conclusions. The main answer to the question raised at the outset in regard to the psychological nature of the conceptual word-meaning may be stated as follows: Under the influence of functional purposive connections which are represented mentally by means of determining tendencies, non-perceptual ideas of the object (*Bewusstheiten*) are formed by giving heed to common partial contents. The formation of the ideal object differentiates itself from mere abstraction by the fact that from the start it is directed upon the object. If the ideal object opposes the economy of thought within the narrow span of consciousness, this tendency is still further enhanced by the fact that signs then become names. But the unavoidable presuppositions of naming, as Fischer too has found, are, first, the logical construction of the perceived object arising from the ideal object, and secondly, a provision for the functional teleological connections.

In what direction can we follow Ach's questions still further? His problem tells us; for although he has limited the question to the formation of the word-meaning, he himself has not failed to observe, in aphasic patients suffering from brain-injuries, that despite the increased difficulty in using language, the achievements of thought demanded by his tests were still possible, though with somewhat greater difficulty than in normal individuals.

Ach's experiment brings the functional mode of observation into the foreground. Although the functional moment of comprehension stands in need of conscious realization, our interest is primarily directed upon the mental purposive connections of understanding.

[1] Examples of failure to extend the use of concepts in cases of acquired feeblemindedness may be found in the work referred to as (5).

The result of this is that the specifically psychological question as to the structure of the conscious realization of meaning, and also as to its genesis (despite the use of several children as subjects), recedes somewhat into the background. One may call Ach's question sociological, and in general there is a danger in putting the question in this form, not only that the psychological problem may be neglected, but also that theoretical constructions are likely to be substituted for psychological investigation. From a sociological point of view one always tends to construct functional connections rationally from the given purpose, and thus to conceive the psychological experience as if the purpose had been grasped logically, and a rational means for its disposal supplied. Therefore, the sociological construction is in a double sense a " purposive rationalization " (Max Weber). It is purposively rationalized (like any scientific investigation) in the effort to find the purpose, and it also rationalizes the empirical-psychological connections between means and end. At least this danger is ever present, the consequence being that the sociological point of view is not very different from *logicism* and *apriorism,* as is usually admitted whenever theoretical limitations are set. But apriorism of a logical or saciological (pragmatic) kind, including *biologism* in particular, deviates sometimes very widely from psychology. For this reason Max Weber (**18**) has denied any kinship between sociology and a psychology that deals with existential psychological data.

The main problem of psychology always remains the comprehension and explanation of existential conscious events, their stages of development, and their individual differences. Sociology, on the other hand, insists quite rightly that it must deal with the super-individual (mental) connections which are given in individual psychological processes; but these can never take the place of a study of the mental processes themselves.

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DISCUSSION

NEUROLOGY: MYSTICAL AND MAGICAL

BY HOWARD C. WARREN

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In a recent article Dr. J. R. Kantor condemns the type of psychology which bases memory upon activities of the nervous system. "We have no room in our description," he says, "for the sorcerous reinstatement of mental states in the remembering mind through a mysterious association of ideas, a process usually made more mysterious still by means of various forms of imaginary neurology."[1] Elsewhere he attacks the view that complex behavior rests upon the integration of reflexes. While we should not "neglect or deny any quality or value of reflexes," he says, on the other hand we should not "attribute to them vague and mystic properties of becoming something else by concretion and aggregation."[2]

It is not the purpose of this discussion to repeat the arguments for the neural interpretation of mental processes. We may readily admit that further empirical evidence is needed before the truth or falsity of this hypothesis can be definitely asserted. But it is high time to protest against the characterization of magic, mystery, and mysticism which Dr. Kantor applies to the neural interpretation of mental phenomena in these and other articles.[3]

This charge strikes at many different schools of psychology. It aims at introspectionist and behaviorist alike, and perhaps at no one more directly than the present writer, whose chief concern has been

[1] "Memory: A Triphase Objective Action." *J. of Phil.*, 1922, **19**, 629.

[2] "The Nervous System, Psychological Fact or Fiction." *J. of Phil.*, 1922, **19**, 42.

[3] Cf. "the manifestations of mysterious instincts," *Psychol. Rev.*, 1921, **28**, 41; "a mystic subconscious reservoir or a fanciful relation of neurones and ideas," PSYCHOL. BULL., 1923, **20**, 81; "by endowing the nervous system with all sorts of mysterious determining powers," PSYCHOL. BULL., 1922, **19**, 442; "the expressions of a mysterious 'general' instinct," *Psychol. Rev.*, 1921, **27**, 60; "a queer doctrine of magical potencies," *Ibid.*, 66; "The peculiar mystery of the recall situation"; "To say that ideas connect themselves because of previous connections, is to create a mystery," *Psychol. Rev.*, 1919, **26**, 13; "we must frequently resort to the magical use of the nervous system," *J. of Phil.*, 1922, **19**, 49.

to discover the neural processes involved in responsive activity. To the scientist the terms *sorcerous, magical, mysterious,* and *mystical* usually denote a description or explanation of events in which the causes are admittedly inadequate or inappropriate to the effect produced. Assuming that Dr. Kantor is using these qualifying adjectives in the accepted sense, they seem singularly misplaced. For the present writer at least has always tried to picture the entire course of organic response from stimulation to reaction in terms of mechanical and chemical processes which follow the accepted principles of science.

To a certain extent the differentiation of science from mysticism lies in the attitude of the observer or narrator. In the tale of Ali Baba, for example, it is asserted that the door of the cavern opened when one pronounced the words, "Open Sesame." This description is intentionally magical, because the story-teller assumes an hiatus in the series of physical events; the effect is avowedly incommensurable with the cause. In our laboratory there is a speech-key which could be so connected up that if one stand before it and say, "Open," the door of our darkroom would swing open. Unlike its Arabian analogue this is not magic, because the writer can picture the entire series of happenings as a well-ordered succession of causes and effects: the sound waves jar the membrane, which makes a contact; an electric circuit is formed which operates a motor connected with the door, which thereupon opens.

Suppose now we artfully conceal the speech-key, the motor, and all the connections, and muffle all significant noises. To the naïve observer the proceeding may seem magical; at least we shall have endeavored to make it appear mysterious to him. But let a scientific observer watch the performance. Although he cannot observe the hidden sequence of events, he knows enough about nature (and artifice) to conclude that there is some definite physical sequence of happenings. To him the occurrence is neither magical nor mysterious—it is merely an unsolved problem. If he hazard a guess, his tentative explanation should be termed an hypothesis—not a myth.

Harking back to our problem of the stimulus-response sequence, one observes a certain stimulus given and a certain response following. The intervening happenings are for the most part hidden from objective observation; we do not as yet know what they are. Nevertheless, certain scientists have ventured to suggest hypothetical descriptions of what these unobserved processes may be. Granting that our suppositions are quite erroneous, at least they are attempts

to fill in the gaps of our present information with processes similar to those which scientific research has already revealed. Dr. Kantor may very properly regard our tentative hypotheses as far-fetched and speculative; but it is scarcely correct to designate them as sorcerous or mysterious. To call them mythical is to pronounce a verdict before the evidence is all in.

If it were legitimate to apply the term mystical to any theory which we are unable to follow through,[1] I might be tempted to use it in connection with Dr. Kantor's own hypothesis; for despite his minute and voluminous discussions of many phases of psychological phenomena, I have not yet succeeded in getting a satisfactory picture of the flow of events which Dr. Kantor describes. On the basis of his descriptions the process *seems* to embody an element of magic.

To illustrate: A meets his friend B after a long absence. A puts out his hand, and forthwith B raises *his* hand and grasps it. The latter movement is not a reflex on B's part, but a fairly complicated act of behavior. The bystander observes the beginning of the process (visual stimulation from A's raised hand) and its conclusion (raising B's hand). But what intervenes? It would seem too vague a description to state merely that the entire organism responds to the stimulus. We want at least a tentative description of *how* the stimulus operates. Or, looking at the response end of the sequence: what causes the finger muscles to contract in the grasp-movement, and what links this mechanical process with the stimulus? If we trace back the sequence of events, step by step, at every point we seem to require definite physiological antecedents, or some adequate substitute therefor to account for the effect produced.

It is scientifically legitimate for Dr. Kantor to assert that behavior is something more than mere muscular contraction and glandular secretion. But, in the example chosen, the muscular contraction, if not the sum-total of the hand-grasping response, is at least a part of it. We are accordingly confronted (among other things) with a problem in mechanics and chemistry, whose solution should conform to the laws of those sciences. This part of our problem Kantor either ignores, or he obscures his explanation beyond the comprehension of many a reader. How are the muscles activated in Dr. Kantor's scheme of things? Why does a certain set of muscles act rather than another in the given situation?

[1] Many instances of this tendency might be cited in current discussions. The present writer confesses to have yielded to the impulse himself in earlier days.

It is just here that the neurological type of psychology serves. For stimulation leads to activity in the sensory nerves, and muscular contraction apparently results from activity in the motor nerves. Unless we take into account the progressive course and transformation of neural activity in the two conduction paths and the connecting central region, our description of the stimulus-response phenomenon seems inadequate and magical.[1] It may be freely admitted that we know but little as yet about the actual workings of nervous energy—that our present-day notions of synaptic resistance, of neural integration and distribution, are crude. But at least our neural hypothesis is in conformity with the general trend of scientific knowledge. The nervous system is an indisputable fact. Its peripheral connections both with the receptors and with the effectors are open to observation. The most satisfactory course, then, would seem to be to investigate the workings of the nervous system first of all. Later on the modifications due to other factors can be examined. The attempt to treat response at the outset as an affair of the whole organism deprives us of the benefit of exact analysis and leads to vague, indefinite descriptions of the process.

One further comment: Dr. Kantor's theory of behavior seems open to challenge in one important particular. He assumes as a fundamental thesis "that any given stimulating situation would necessarily call out an adaptive reaction correlated with that situation,"[2] and that "the specific pathways involved in any reaction are involved because certain muscles or glands need to function."[1] It is the use of the terms *adaptive* and *need* in this connection that we wish to question. In the normal organism with neural connections between receptors and effectors intact, it is scarcely to be doubted that every effective stimulus gives rise to *some* response—that every new stimulus alters the course of whatever responsive activity is proceeding as a result of earlier stimuli. But is the new response (or modification of response) "necessarily adaptive"? Are certain specific muscles energized because they "need to function"?

The term "adaptive" denotes an *improvement* of the creature's

[1] The question as to whether "consciousness" enters in as a factor at some stage of the sequence need not be raised here, except to note that it behooves those who adopt that view to indicate *how* this nonphysical factor affects the course of physiological activity.

[2] "The Nervous System, Psychological Fact or Fiction?" *J. of Phil.*, 1922, **19**, 47.

[1] "The Psychology of Reflex Action." *Amer. J. of Psychol.*, 1922, **33**, 28.

relation to his environment. In this sense the light-stimulus which leads to the moth's flying into an arc-light and thereby destroying himself does not result in an adaptive response. Responses may be anti-adaptive or neutral as well as adaptive.

It seems demonstrable that the majority of the responses of organisms are adaptive or neutral—that comparatively few are anti-adaptive. One of the tasks of psychology is to indicate why this is so. For my own part, I see no better explanation of this phenomenon than the general principle of natural selection. And here the neural mechanism is of especial service. For just as all the other organs of the body have evolved by variation and selection to perform certain operations, so the general topography of the nervous system may be assumed to have evolved in such manner that the more useful connections have been preserved and the more detrimental ones eliminated. Thus the young of any species (with few exceptions) come at birth into the wider extrauterine environment provided with a mechanism which from the start enables them to perform many adaptive (*i.e.,* life-preserving) reactions. Moreover, as the growing creature's behavior becomes continually more complex through the multiplication of stimuli, any detrimental complex reactions that have chanced to arise are gradually eliminated by a similar selective process—only the selection now takes place in the individual, and not in the race. If the human child stumbles over a threshold once, or if he thrusts his finger into a flame, inhibitive stimuli are set up, which are likely to prevent a recurrence of the same detrimental response. At the same time new complex responses that are useful become accentuated. Just how these functional eliminations and acquisitions are effected is a major problem for psychology. We merely beg the question if we assert that every response is *ipso facto* adaptive. Nor is it one whit more satisfactory to describe the adjustment wholly in mental terms—to say that the response occurs because it is "needed." For the course of the reaction, whatever else it may involve, includes a progressive transfer of physical energy in the creature's body—and for the most part within the nervous system. How a "need" can alter the direction of this force is a serious problem; it is by no means an axiomatic truth.

Let us by all means admit that psychology is a broader (or higher) science than physiology; nevertheless its data depend upon physiological phenomena, just as these in turn depend upon chemical and other basal phenomena. What we require as a foundation for its study is a schematic view (if a detailed description is not avail-

able) which will enable one to picture and understand how the flow of physical energy, following the path of least resistance, comes to produce such intricate adaptive responses as are observable in all higher organisms and particularly in man.

Dr. Kantor's well-woven descriptions do not seem to present a complete picture of the functional situation. Perhaps this is because he has wrought his tapestry on too large a scale, so that we see merely the details and not the total picture. Such blemishes as have been noted here stand out too prominent in the pattern.[1] It would be a great help to Dr. Kantor's readers if he would give a brief résumé of his general theory, with special reference to these difficulties, which have doubtless puzzled others besides the present writer.

A SIMPLE BARRIER FOR THE EARS

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Some years ago I called attention to a simple, yet effective, "blind for the eyes."[1] The recent development of radio-telephony now provides us with a relatively inexpensive device for the occlusion of undesirable sounds, or rather for the substitution of a uniform sound for uncontrolled fortuitous disturbances. The principle is the same as that found in the "blind." When we cover the eyes, psychologically we are substituting a uniform gray sensation, within the limits of adaptation, for the miscellaneous array of hues, tints, and saturations that ordinarily passes before the mind. So in acoustics, and even in other fields of investigation such as in attention, the practice of substituting a continuous sound for chance stimulations has arisen. Dodge's work on rotation furnishes us with a good example of the application of this principle in doing away with disturbing auditory cues.[2]

In the smaller laboratories, especially where there are no

[1] Note also such dogmatic generalizations as: "nor can there ever be established," *J. of Phil.*, 1922, **19**, 41; "it is unthinkable," *ibid.*, p. 42; which project from the texture of his argument like knots to bind the broken threads.

[1] RUCKMICK, C. A. A Note on Apparatus. PSYCHOL. BULL., 1912, **9**, 247–248.

[2] DODGE, R. Thresholds of Rotation. *J. of Exper. Psychol.*, 1923, **6**, 107–137; see particularly p. 133.

" sound-proof " rooms, it is always a problem to find instruments that measure up to scientific expectations and that can be had at a reasonable price. The equipment needed for shutting out undesirable sounds can be purchased for less than five dollars. " Head-sets," or double telephone receivers with head-band attached and of 2000 to 3000 ohms resistance, can now be bought for a little over three dollars. If discrimination is used, a very good grade can be obtained at this price. The terminals of this set are then connected to the terminals of a " bell-ringing " transformer, which in itself is a valuable addition to the laboratory. These transformers operate on the ordinary 110 volt alternating circuit, deliver 6, 8, and 14 volts, and can be purchased for less than a dollar. The 6 volt terminal should be used for our present purpose and then only with a considerable amount of resistance in series. After trying out a number of resistances I found a moistened strip of cardboard 30 cm. long and 2 cm. wide placed in series to give most satisfactory results. A still weaker sound is given through the telephones when one terminal is connected to the transformer and the other is held in the hand or in other ways connected to the body. In fact a great many variations of intensity are possible from the simple occlusion of sound without current to the very loud hum produced by the 8 volt contact. Through the moderate intensities the sound is by no means unpleasant. Its pitch corresponds, of course, to that of the 60 cycle frequency giving roughly A_1 in the international pitch system. In any event the method is more effective and reliable as well as more sanitary and comfortable than the customary practice of plugging the ears.

SPECIAL REVIEWS

GIVLER, R. C. *Psychology, the Science of Human Behavior.* New York: Harper, 1922. Pp. 382.

Normal human psychology is treated in the first twenty-five chapters (pp. 1–267). The last eleven chapters deal with " the applications of psychology to the various interests of human life." The book will appeal particularly to the student who is taking his first as well as his last course in psychology, but the general reader will find little that is new. The author states that psychology concerns not only the human mind, but also " the part which the human body plays in causing and regulating mental phenomena." Psychology is " the science of human activity in its largest and most

pervasive sense." The relation between psychology and the mind is not cleared up, but mental activity itself is said to be "a combination of physical, chemical, and electrical energies developed by the nerves, muscles, and glands of the human organism" (p. 12). It seems to the reviewer that if the justification for the term mind is its popular use, then the popular definition should be employed. It is difficult to see what other justification there could be. The author makes a desperate effort to show how the mind is related to the rest of the universe. In spite of this vaporous term, however, proper emphasis is placed on the objective aspects of psychology. Some good illustrations of Givler's constant interest in objective psychology may be found in his descriptions of how we learn to breathe, swallow, and fixate, as well as in the account of the grasping reflex in young children (pp. 36–43). The subconscious and unconscious are conceived as follows: "The subconscious mind means the sum of the knowledge or skill which we once patiently acquired, but which we now only recognize vaguely as our *experience;* while the unconscious mind refers chiefly to racial and family inheritances which give the peculiar trend and bias that makes the experiences we have acquired particularly *ours*" (p. 47). The reviewer is inclined to think that the terms unconscious and subconscious have lived long enough. Why not speak of mechanical, automatic or nonconscious activities, on the one hand, and consciousness, on the other? Psychologists could then use the same language. By instinct, Givler means all subconscious and unconscious tendencies and processes! The fundamental instincts of all living beings, including man, are chemotaxis, thermotaxis, heliotaxis and barataxis. Other more complicated instincts have to do with food, air, warmth, and cold.

The subject of sensation follows naturally after the account of instinct and "The Kinetic System," in which latter case the author follows Crile. The chapters on sensation (pp. 62–128) are among the most satisfactory accounts available for the use of elementary students. James and Lange are not mentioned in the chapter on emotion. Instead of dealing with this theoretical subject of questionable value, we find a good account of the bodily changes and expressive movements of the emotional states. This chapter would have been even more satisfactory if some of the material on psychogalvanic technique and the relation of emotional states to hydrogen ion concentration had also been included. In the next chapter on the sentiments, the author follows McDougall in listing the primary

emotions and in describing how they combine to make the sentiments. Proper attention is paid to stimulus-response psychology also in the chapters on the perception of space and time. As in the sections dealing with the nervous system, however, there are several small mistakes which could have been eliminated without material injury to the style and plan of the book.

The mechanism by which associations are formed is the conditioned reflex. "Ideas are really reactions which are carried out without the normal stimulus to such reactions being present" (p. 202). The flow of imaginations in our minds is due to the millions of conditioned reflexes which we have acquired. Givler, like several other psychologists, has got away from the idea of associating two objects together. What is connected is a stimulus and a response. The subject of memory is dealt with in a chapter of only ten pages. The author includes in the definition of memory the "awareness of having experienced the fact or event before." Later, however, he seems to be speaking of nonconscious as well as of conscious memory. A much better selection of material could have been made in this chapter, as well as in a former one on reaction time. The next five chapters deal with imagination, attention, reasoning, habit and will (pp. 218–267). The author maintains the same good style and attractive presentation. In the latter part of the book, we find in order chapters on fatigue, sleep, dreams, suggestion, hypnotism, the mind of the crowd, salesmanship, advertising, wit and humor, industrial psychology, and mental hygiene (pp. 268–382). These pages would make excellent reading for any elementary student.

Almost no reference is made to animal psychology or to abnormal psychology. Although the author says he is going to limit himself to normal human psychology, some good illustrations could have been taken from the other two fields. There are too many quotations from a rather limited group of psychologists and physiologists for an elementary text. The more favored among these are Edwin Holt, George W. Crile, E. B. Titchener, W. B. Pillsbury, William McDougall, Percy Stiles, and William James. If the book is to be "a composite photograph of modern psychological tendencies," as the author claims in the preface, then quotations might have been made from several other psychologists as well. Givler does not give the name of the writer from whom he is quoting in all cases; and page references would also have added to the general usefulness of the book. The style ranks with the best to-day; and humorous remarks throughout the book add to its pleasing effect.

There are numerous full-page photographs of laboratory apparatus, with experimenter and subject, and a few photographs of athletes show various degrees of fatigue and strain. The value of such a large number of rather ornamental photographs is questionable even in a book with popular propensities, since they are not closely connected with the reading matter. The chapters are not supplied with references for further reading, and there is no index. The book ends with a sympathetic reference to the "soul." The reviewer, however, is not certain as to the advisability of using this term, since some psychologists do not know what it means.

HULSEY CASON

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LINDWORSKY, J. *Experimentelle Psychologie.* Munich: Kösel & Pustet, 1921. Pp. 306.

Like virtually all the publications written by members of the Jesuit society to which the author belongs, this book is a monument of "Belesenheit," as they say in German, or "scholarship" as we say in English. The author regrets that the high cost of paper forced him to omit the bibliography. But even so, one is impressed by the sign that the author has read every book and magazine article ever published in the German language and being classifiable under philosophy or psychology. But there is hardly any evidence in the book that anything exists in any other (modern) language, or that the author is familiar with the subject matter and the problems of the other sciences except in so far as these are available as quotations in the philosophic-psychological literature. To prove this by a single instance, the author says (p. 41): "Helmholtz proved experimentally that, when we produce any tones we also produce at the same time certain 'overtones,' sometimes fewer, sometimes more." Now, the student of physics knows that that is not a discovery of Helmholtz, but had been experimentally proved a century before Helmholtz was born. This is not said to belittle the author, for no one can know everything, but to show the limitations of this book. It is a splendid textbook for teaching *German students in Catholic schools those things going under the name of psychology which the author intends to teach them, and to which he intends to limit them.*

From what has been said the reader of this review will be prepared to be informed that "animal psychology" is not mentioned in the book except by the implication contained in the teaching that

animals have no consciousness, or that, at least, they have no consciousness of the kind that would interest the psychologist. The author states emphatically in the preface that the very center of his whole psychology is the consciousness of the "*Beziehungserfassung*, which in the human life of knowing is hardly ever missing, but which in the animal life of knowing does not exist."

The book consists of five divisions. I. Psychical elements and their elemental groupings. Here we find what English-speaking psychologists usually call sensation and perception. II. The revival of presentations as the basis of the higher psychical achievements. This is what is usually called the association of ideas. III. The higher psychical achievements of the individual. He might have called it also the intellect and the will. Here is a sample of the treatment: "Seemingly a dog is pleased or is afraid like a human being. But that is an illusion, for the dog lacks completely the higher feelings. He lacks them, because he lacks the *Beziehungserfassung* which grounds the feelings in reason. Thus the feelings of man are capable of being much deeper (that is obviously why he calls them higher!) than the feelings of the animals." To the reviewer this third division of the book is nothing but a curious kind of metaphysics. Those who are interested in metaphysics will undoubtedly enjoy reading it. IV. The psychical achievements depending on human society: Language, Morality, Art and Religion. V. Exceptional conditions of the soul: Sleep, Dreams, Hypnosis. Claparede's view that sleeping is an instinctive action the author kills with the cheap argument: Sleeping can not be an instinctive action, because instinctive actions are conscious actions; but sleeping is not a conscious action, but a status.

MAX F. MEYER

UNIVERSITY OF MISSOURI

McKERROW, J. C. *The Appearance of Mind.* London: Longmans, Green, 1923. Pp. xv+120. $2.00.

This is an amazing book and shows very well the limitations of dialectical reasoning. Like Kant, the author shows that pure reason is "Pickwickian" and can be made to demonstrate almost any paradox. The particular paradox which the author sets out to demonstrate is that consciousness is an illusion. How there could be an "illusion" without consciousness he does not tell us. Like the behaviorists, he would get rid of all subjective terms and substitute

for such terms as cognition, affection, and conation, the conception of a "Tendency to Viable Equilibrium." This tendency in different situations will explain what we call sense-consciousness and also thought-consciousness. There is no need, therefore, in psychology for any words referring to a "Subject." From the scientific point of view, or the point of view of pure reason, there are no conscious processes. Science should stick to the interpretation of processes in terms of the equilibration of energy.

The spirit of the book is well illustrated by these concluding sentences: "When our ancestors, the first motile organisms, getting into hot water, changed the direction of their movement, implying, 'This is painful,'—an illusion, as their cousins, the plants, could have told them—they laid the foundation of *our* illusions, about the universe and ourselves. For our consciousness is an illusion, or rather, our sense-consciousness is hallucination, and our knowledge delusion—a delusion to which all but the wisest are subject."

It is difficult at times to believe that the book is not ironical, but the author's "apologia" which he appends to the book shows that he is undoubtedly sincere, and that his purpose, like Kant's, is to show that while we may believe one thing from the standpoint of practical reason we must believe the opposite from the standpoint of pure reason. In other words, science is the opposite of common sense, and the only solution of the conflict of science and common sense, or of religion and science, is to accept both in their proper place, but not let one interfere with the other. The book seems to the reviewer an attempt by the author to justify to himself his acceptance of both religion and the scientific method, rather than strictly a scientific work. Science will never advance by such exhibitions of the futility of dialectical reasoning.

CHARLES A. ELLWOOD

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MILLER, H. CRIGHTON. *The New Psychology and the Teacher.* New York: Seltzer, 1922. Pp. 225.

This small book, easily readable, is a good book for the teacher because it teaches the teacher (and parents, who naturally have to play the rôle of teachers) that too much protection of the growing person against the natural process of learning by exposure to the hard knocks of life is bad for that person in his later, adult life. This overprotection against the hardships of life is often given by

suggesting means of escaping those hardships which may have been suitable means in the life of the teacher, but which do not happen to suit the individuality of the person taught. Some, *i.e.*, abnormal, individuals receive the suggestions too readily and use them instead of learning the lessons of life, and then have to suffer. The author's warning may do some of those who read his book a great deal of good. But there is not really any new educational theory involved, as the title seems to suggest. And the New psychology (psychoanalysis) seems to have been brought into play only because that is fashionable in the year 1922.

MAX F. MEYER

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BROWN, W., and THOMSON, G. H. *The Essentials of Mental Measurement.* Cambridge: University Press. Pp. x+216.

The present book is the second edition of Dr. Brown's *Mental Measurement,* brought out in collaboration with Professor Thomson. Three chapters only remain unaltered and form the nucleus out of which the book has grown. The additions and expansions more than double the original size of the book and vastly increase its value. The first part, containing the chapters of psychophysics, may be taken as a correct presentation of the present status of this science. The chapters on correlational psychology contain much controversial matter, and are largely influenced by the well-known opposition of the two authors against the ideas of Professor Spearman.

It seems that the book should serve excellently as a textbook for a course on psychophysics and the use of correlation in psychology. The fundamental difficulty of such a course consists in its being given to students with a limited knowledge of, and a limited interest in, mathematics. The ordinary textbooks are not adapted to the needs of the student, and contain much which is of no consequence to the particular problems of psychology. The author of a textbook first has to make up his mind as to what is of real importance for psychophysical and correlational work, and then the text must be written so as to suit a reader to whom the propositions can not be more than a serviceable tool. Professor Thomson, who is responsible for most of the mathematical text, has succeeded admirably in his difficult task. The presentation is within the grasp of every attentive reader, and the chapters on the elementary theory of probability and on correlation should serve well as an introduction into this kind of work.

Professor Thomson's own research covers almost the whole ground of psychophysics, and in his text all the recent publications are taken into consideration. The reader gladly remarks an improvement in the theory of the method of just perceptible differences, and a suggestion of a shortcut in the arrangement of the computation. The classical constant process is discussed under the heading "Methods which fit smooth curves to the data." This part of the book is all the more valuable for the student, since an appendix contains the tables needed for actual work.

The remark that these highly refined processes should not be applied, unless the accuracy of the experimental material justifies it is very true. There exists no magic by which good results are obtained from poor material. It is one of the points made by modern psychophysics that labor should not be wasted in working out the results of bad experiments. Only good experiments should be performed, and their treatment should get everything out of the data that there is in them. The amount of time and work required for the computation is very small compared with the amount of work needed for experimentation. Take for instance Professor Fernberger's doctorate thesis. The experiments lasted for many months, but it would not take more than a week or ten days to have them worked out by a competent worker. The present book will convince the reader that it is not very hard to acquire the necessary technique, and one may hope that the book will have a beneficial influence toward raising the standard in psychophysical experimentation.

The book is a faithful survey of the present status of psychophysics and, as such, shows the gaps of our information. The method of average error is treated on a little more than a page, and the method of mean gradation is hardly more than touched upon. This procedure is well justified. Our insight into these two methods is very small in comparison to our precise information in regard to the methods of just perceptible differences and of constant stimuli. Professor Thomson's presentation ought to be a suggestion to future workers to take up these problems which remain neglected.

The method of average error lends itself to an analysis similar to that of the method of just perceptible differences. It is easy to express the result of this method in terms of the probabilities of the different judgments on the stimuli used. The method requires that the equality cases should be taken into consideration, and this involves the difficulty that the subject hardly will retain the same standard during the experimentation. The other difficulty is one of experi-

mentation and consists in procuring data which may be worked out by this and by the constant process. The situation is entirely different in regard to the method of mean gradation, and it seems that we will have to wait patiently for new developments.

Chapter IV deals with skewness and heterogeneity of psychophysical data. This chapter is Professor Thomson's own contribution, who worked in the content of his prize essay on the use of Pearson's formulæ in psychophysics. It begins with a discussion of Pearson's test for the goodness of fit as applied to the methods of average error and of constant stimuli. It is shown on some experimental data that the deviations from the normal curve are such as not to be attributed to sampling errors alone. The conclusion is drawn that either (a) the material is homogeneous, but the underlying factors which cause the distribution of errors are not independent, or (b) that the material is not homogeneous, the conditions of the experiment not having remained constant throughout. It is shown how the summation method of finding moments may be applied to psychophysical data, and how a skew distribution may be analyzed into two normal curves. The calculation is carried through on some of my data and the result shows that the subject's sensitivity oscillated between at least two states, one of which is such as to give a skew curve. This suggests that we have to deal with a heterogeneous process consisting of at least two components. The first, corresponding to a very wide and shallow distribution, represents the erratic answers, while the second component really corresponds to the conditions of the experiment.

This chapter, beyond doubt, represents one of the most important of Professor Thomson's many contributions to psychophysics, and one that will exert a far reaching influence. The presentation, in some places, is perhaps a little concise and technical, but with the exception of paragraph 7 the text contains everything that is needed for following the argumentation. The paragraph on the analysis into two normal curves is too short, and the reader who is not well acquainted with this topic, hardly will be able to grasp it. It is wished that Professor Thomson may find many followers who cultivate this line of work.

The second part of the book deals with correlation. Chapter V serves as an introduction, and Chapter VI contains the mathematical theory of correlation. Add Chapter VII on the influence of selection, and Chapter VIII on the correction of raw correlation coefficients, and you have a fairly complete account of the elementary

theory of correlation. Clearness of presentation and a very workmanlike statement of the practical problems make the text extremely valuable to the student of psychology. Chapters IX and X explain Professor Spearman's theory of general ability, and Professor Thomson's criticism of the view.

F. M. URBAN

BRÜNN

DWELSHAUVERS, G. *La Psychologie Francaise Contemporaine.* Paris: Alcan, 1920. Pp. xii+260.

It is a fact worth thinking about that Ribot could write a history of *English* psychology and a history of *German* psychology and that Dwelshauvers should now have written a history of *French* psychology—as if, in a *science,* there could be *national* psychologies. Even writers of a general history of psychology often find it more convenient to trace the development of the science along national lines instead of considering progress in the refinement of methods, the better statement of problems, and the accumulation of fact. It ought not to be possible for a man to write a national psychology unless he had in mind—and this is certainly not the case in the histories mentioned—merely magnifying the contributions of his own countrymen to problems that are not provincial. A scientific problem can no more be a national problem than it can be an economical, moral or esthetic problem. The appearance of another history of national psychology has not yet attained its scientific majority.

The effects of nationalism and provincialism are all too apparent in American psychology. Upon the orthodox background furnished by J. Edwards, Tappan, Porter, Upham, Hickok, and McCosh there has been set, in turn, British empiricism and associationism, German physiological psychology and mental atomism, French mental pathology and dynamism, and Darwinism. Somehow out of the mixture has come our own provincial contribution, behaviorism. French psychology is like American psychology in that it too is a mixture. Some of the ingredients come from the days of Descartes and Melebranche and among the others are the English and German traditions, and most important of all, voluntarism or dynamism.

Dwelshauvers' history of recent French psychology is the outcome of a conversation with Ribot in which regrets were exchanged that French psychology had not yet found an historian. The book (it follows the plan adopted by Ribot) begins with Maine de Biran

"l'initiateur de la psychologie contemporaine." The second chapter takes up the eclectic movement from Royer-Collard to Paul Janet. Chapter three speaks of the systems opposed to eclecticism as they were formulated by Comte, Cournot, Renouvier, Ravisson and Durand. The next chapter studies the foundation of "scientific psychology" in France under the direction of Taine, Ribot, and Tarde. The chapter speaks also of Binet, Janet, and Paulhan as representing three tendencies in French experimental psychology, viz.: (a) the experimental method proper, (b) the pathological method, and (c) the method of observation and analysis. The fifth chapter points out how Fouillée with his "idées forces," Lachelier, Boutroux, Hannequin, Jules Lagneau, Brunschvicq and Lalande sought either to fuse the scientific spirit with rationalism or to go back to idealism and neo-spiritualism. The sixth chapter (as one might expect from the philosophical tenor of the whole book) treats of Bergson. The conclusion (chapter vii) selects the dominant ideas which, according to the author, are essential and permanent in contemporary French psychology.

Dwelshauvers begins with Maine de Biran (1766–1824) for with him, he says, the method of "observation interieure" and the facts of biology, physiology and mental pathology were first used in a modern way. In selecting Biran as the founder of the new French psychology, Dwelshauvers has chosen differently than have American and German historians. Condillac (1715–1780) who, in a certain sense, also began the modern period in France and Cabanis (1757–1808) who is said (Brett) to have been the founder of modern physiological psychology, are not even suggested for the rôle of "father" to contemporary science. If we regard French psychology in the large (not merely the history of dynamism) Taine (1828–1893) might better have been chosen as the beginning of modern psychology for it was his searching inquiries that finally led to the development of experimental psychology under Ribot, Binet and others.

Maine de Biran (1766–1824) did his work when French sensationalism (brought to the continent by Condillac) was at its height. Biran himself was trained in the sensationalistic school; but in his examination of mental life he came upon "l'activité mentale," or "la conscience de l'effort," discoveries which were destined to shape the whole course of his own psychology and much of subsequent French philosophy. In emphasizing mental activity Biran thought to make up for a serious lack in the system of Condillac. Condillac

had treated man as a passive recipient of impressions; Biran began thinking of him as a dynamic agent. Condillac had given up whatever dynamism there was in Locke's doctrine of reflection and Biran (Cabanis was leading toward it) was one of the first to react against intellectual passivism. This, according to Dwelshauvers, is the virtue which earns for him the title of "founder." In addition to his revolt against "le système abstrait de Condillac" Biran was greatly impressed by the work of the vitalists, especially Barthez and Bichat. And there was also the physicist Ampère with whom Biran exchanged many letters and conversations. Dwelshauvers points out very clearly other conditions under which Biran's system was formed and the effect which voluntarism had on the day's psychology.

As the pendulum went to an extreme against sensationalism and in favor of dynamism or voluntarism it was natural that a group should arise to take the best from each side. The men who did this were Cousin (1792–1867), Royer-Collard and Jouffroy (1796–1842). Dwelshauvers considers Jouffroy the most prominent member of this group even though eclecticism was founded by Cousin. The transition from sensationalism to eclecticism was made by Laromiguière (1756–1837). The opposition against Condillac was most vigorous at the hands of Royer-Collard who brought to his aid the Scottish school represented by Thomas Reid and Dugald Stewart. Jouffroy made Reid and Stewart popular in France by translating their works into the French language.

The rise of Positivism has been described in a good many places—often better than Dwelshauvers has done it. The author points out, however, some of the psychological contributions made by Comte that are not often considered. He rejects the notion that because Comte depreciated psychology (Comte was really attacking the eclectic school) he had no value to the science. It is pointed out that Comte put the relations between animal psychology and human psychology into a new light, that he raised the passions and the sentiments to the rank of the more intellectual functions, that he was one of the first to appreciate mental pathology, and finally that he saw what could be drawn from a study of mental products, viz., language, science, art and religion. The author points out, moreover, that Comte's objections to a science of psychology raised certain issues which later were resolved to the advantage of psychology by Taine and Ribot. Most of the pages on Comte are spent in retailing the familiar objections to "l'observation interne" and the operation

of the methods of positive science. The chapter continues with an exposition of how the notions of Comte were worked over and modified by Durkheim and Lévy-Bruhl and a few words are given to Le Bon. There is little of first-rate psychological importance in the discussion of Cournot (1801–1877), Renouvier (1815–1903). and of Ravaisson-Mollien (1813–1900), each of whom followed Comte more or less closely, especially in opposing the eclectic school.

Chapter four is the most important chapter to a psychologist for more is said there about the development of psychology than at any other place. The chapter begins with Taine (1828–1893) who "donna le coup de grâce à l'école eclectique," and who also gave "des modèles d'une psychologie concrète." Taine imported Mill into France and while in a sense he represents the culmination of French associationism he was greatly influenced by the growing German school. "Le rôle du psychologue est de découvrir les éléments des représentations, le loi d'assemblage de ces éléments et les phénomènes physiologiques qui las soutiennent. En d'autres termes, la psychologie de Taine est un atomisme mental" (p. 103).

In a few well-written pages the author shows how the empirical and experimental spirit of Taine grew under Ribot (1839–1916). The increasing theoretical and experimental value of mental pathology helped Ribot to get rid of the abstractions which had been left over from Condillac; but he sought to retain whatever was worth while in understanding mental life as a whole. Under Ribot there developed, according to the author, a Paris school of psychology. "Ce qui intéresse l'école de Paris, c'est l'activité mentale telle qu'elle se présente de manière concrète, ce sont ses aspects pris dans leur ensemble, ce sont les variations de ces aspects les uns en fonction des autres: la vie et les transformations des images, les rapports de l'émotion aux rythmes organiques, le développement de l'intelligence, les limites de l'automatisme et de la conscience, le subconscient, les états affectifs, les rêves. Or, ces formes complexes d'activité ne sauraient s'étudier en éliminant l'elément personnel, en prenant des moyennes et en formulant des lois imitées de la physique" (p. 127). To these problems and to the Paris school of psychology Ribot brought three groups of methods, viz., subjective, objective and experimental. Introspection is the foundation of the subjective methods. Objective methods are direct or indirect. The former look toward behavior among men and animals, and they make use of mental tests and biometric measurements. The latter use biographies, historical facts, memoirs and religions. Psycho-physio-

logical, psycho-physical and pathological methods are subdivisions under "les méthodes expérimentales." The first are valuable. The second "inaugurées au laboratoire de Leipzig en 1870" have produced "almost nothing." The third (les méthodes pathologiques) are the most fruitful.

The five pages given to Binet (1857–1911) show very nicely his place in French psychology. Binet was indifferent to German psychology and although brought up under associationism, the lectures of Charcot and the synthetic spirit of French metaphysics soon sent him upon a search for the "mental functions," judgment, reasoning, imagination, memory, and sentiment. The need of regarding mental life synthetically—that is, of speaking of intelligence, character, and personality instead of sensation and association—was impressed upon him by his studies in alterations of personality.

Binet, according to the author, was the most vigorous exponent of experimental methods. His methods touched upon general intelligence, however, and not upon the type of analytical problem set by the Germans. Pierre Janet is the best exponent of the pathological method. The author's attempt to place mental pathology is disappointing. He considers in a popular vein some of the more common things in pathology; but he fails to show precisely their place in contemporary French psychology.

Paulhan is described by the author as representing the analytical method in French psychology. The description of his contribution to the Paris school of psychology is concise, especially the discussion of his treatment of the laws of association. Tarde (1843-1904) secures ten pages of exposition and appreciation. The main points of his social psychology are set down and the conclusion is drawn that Tarde is the first to have formulated a scientific theory of social psychology—that he has worked out a complete system without being dogmatic.

Fouillée (1838–1912) helped to carry the banner of "l'observation interne" and dynamism from Biran to Bergson. Dwelshauvers points out carefully the change wrought by Fouillée in the dynamistic doctrine of Biran and he shows also the philosophical improvements brought by Bergson. Dwelshauvers makes no attempt to relate the idealistic and neo-spiritualistic trend of Lachelier, Boutroux, Hannequin, Lagneau, Brunschvicg and Lalande to the psychological problems of the day save as they are reprinted in Bergson.

Chapter VI, the last save for a conclusion, treats professedly of the psychology of Bergson. The account is fair enough but cer-

tainly not any better than accounts given by English students. There is practically no attempt to distinguish Bergson's psychology; but only an account of his general philosophical position. Bergson picked up the "l'observation interne" from where it had fallen after the downfall of the eclectics and thoroughly rehabilitated it. "Il montra qu'elle était le méthode psychologique par excellence" (p. 199). Using the method as did Biran he found "in our consciousness a dynamism, an internal combination of forces" into which we could plunge by intuition (p. 200). To anyone who has read Bergson at all there is nothing new in the pages which treat, in turn, of the external world, of perception, of memory, of the relation between mind and body and of creative evolution. In a history of French psychology, the critical examination of Bergson included in the final paragraphs of this chapter are disappointing. The reader finds only an attempt to understand and evaluate Bergson's intuitive insurrection against mechanism, psychophysics, mental chemistry and rationalism.

To begin with Biran and to end with Bergson makes the book appear as though it were a history and a partial defense of spiritualistic or dynamistic philosophy in France instead of a history of experimental psychology. The writer frequently draws attention to the artificial and abstract analyses of the English and the barren physiological psychology of the Germans and the contrast which obtains between these and the broad synthetic view of the French. In the conclusion, dynamism and mental organization (synergie, équilibre ou harmonie) are found to be the chief virtues of French psychology. "L'acte synthétique de l'esprit anime intérieurement toute la vie psychique" (p. 243). In parts of the book there is an unfortunate hint of scouting English and German psychology and of lauding the balance and perspective of French psychology. "Le grand mérite de la psychologie scientifique en France a été de viser précisément à connaitre les processus et les fonctions de la vie mentale, sans vouloir les décomposer en atomes dépouillés de toute subjectivité" (p. 127). ". . . les psychologues francais, avec une liberté de jugement qui ne c'est pas départie un instant, fondaient la science de l'esprit, instituaient ses methodes, découvraient le dynamisme des idées, mettaient en lumière et le rationnel et le sentiment du vécu, et, d'une part, s'aidant de la pathologie, d'autre part élargissant singulièrement l'emploi des méthodes expérimentales, ils arrivaient a définir un ensemble de fonctions, à découvrir leurs

rapports, à établir leurs liens et à préciser la connaissance de l'esprit comme activité, unité et synthèse" (p. 234).

Dwelshauvers set out, apparently, to write a history of French psychology that would be read outside as well as inside of academic circles. He has succeeded in doing this for the book runs along in an easy and interesting manner. But the author has paid for this virtue. There is no searching attempt to relate his history to the profound social and political currents that did so much to set the course of French thinking in the last century. Neither does the author connect himself sympathetically with those great scientific and philosophical movements in Germany and in England which have affected the thinking of the whole continent. The book is, moreover, devoid of the references and critical notes which so often go with a searching historical inquiry. In making this criticism the reviewer has not forgotten the many times he was impressed by the skill with which Dwelshauvers shows how philosophies and points of view were determined by the training and by the personal history of French thinkers. Dwelshauvers has, moreover, great skill as an expositor. He knows how to select the essential points in a system and write clearly about them.

Since, as the author states, mental pathology has played so large a part in French psychology, there ought to have been a fuller account of its origin and development. To many American minds this is one of the most important contributions France has made to psychology; but Dwelshauvers leaves us without having made any attempt to provide a proper perspective in this branch of the science.

On the whole the book is a valuable addition to the history of psychology. There is a warmth and sympathy in it which only a writer who stands close to the men written about can have. The author is impressed with the importance of French scientific and philosophical thought and he makes the most of his opportunity to establish it historically. In reading the book one wonders what the course of psychology might have been had the center of continental learning not passed to Germany after the Franco-Prussian War.

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UNIVERSITY OF ILLINOIS

ROBACK, A. A. *Behaviorism and Psychology.* Cambridge, Mass.: University Bookstore, 1923. Pp. 284.

This book is a violent denunciation of the whole behavioristic proposition. The purpose of the book as stated by the author is the confutation of the claim of behaviorism to the title of psychology. He divides his argument into four parts. In the first part he touches very briefly upon the historical development of behaviorism as it has evolved to-day, its antecedents, and its varieties. The second part he devotes to a critical survey of the principles of behaviorism. In this part he considers such questions as what does "behavior" mean? What constitutes the unit of behavior? He discusses the logical groundwork, the philosophical basis and outlook of behaviorism, stating that "the arguments that the behaviorists have enlisted in their behalf have most of the old age-worn fallacies lurking beneath them." Part three is devoted to the impossibility of the practical application of behaviorism. Behaviorism is incompatible with ethics. It would cause a distressing upheaval in jurisprudence. It is not helpful in medicine. It is incongruous with religion. The acceptance of the radical or orthodox behavioristic platform would cause an inevitable collapse in the social sciences. Part four gives a glimpse into the future of both behaviorism and *psychology.* The author declares that he is willing to assign behaviorism to a place as an extension of physiology and he would call this extension "behavioristics." He also favors the term suggested by Mercier and Dunlap—"praxiology"—to cover the facts of the proposed new science. The behavioristic hypothesis or assumption is a stagnant affair in that it usually promises a great deal and balks at the crucial point. It is a conglomeration of neurology, physiology, biology and journalism. That behaviorism possesses a certain value goes without saying but its coming into being really affects the future of physiology rather than the progress of psychology.

The author tries to show: (1) The concept of behavior is too general to afford us the foundation of a separate science; (2) behaviorism presents most of the difficulties peculiar to traditional psychology and many more; (3) behaviorism in its restricted sense seeks arbitrarily to dominate a field which is not, *ex hypothesi,* under its jurisdiction, by bowing out of court everything which does not fit into its narrow framework; and (4) behaviorism does not readily lend itself to application.

The following quotation, which constitutes the closing paragraphs

of the book, gives a very good idea of the material and manner of treatment: "Naturally the behaviorist is better off than the mentalist. He has no dilemma before him, *for he has nothing to explain.* Taking an introspective datum he shows merely how it would be possible to treat it in objective but indeterminate terms such as 'adjustment,' 'reaction-patterns,' 'conditioned reflexes,' 'behavior cues' and the like. He suggests, he hints, proposes, affirms, projects, but he does not explain, much less can he predict except in a general way as a man in the street would.

"We have heard the clever gibe about psychology first losing its soul, then its mind, then consciousness. It would be easy for psychology in an uncharitable mood to retort that not she but certain of her professed votaries have been the losers in this case, and that it is not much of a consolation to be left with mindless behavior in the place of the real article."

The author weakens his case greatly by the pugnacious manner in which he writes. To the reader it appears impossible for a man to be an unbiased critic or an open-minded commentator, who *feels* so strongly on a subject that he personally berates all individuals whose opinions differ from his own. The criticism which he makes of the behaviorists—that they "coolly take things for granted that are as difficult to prove as for a camel to go through the eye of a needle"—might well be turned against the author. His book is full of statements which if pressed for proof as to their accuracy and authenticity he would have a very difficult time explaining. These freely and somewhat unguardedly made statements, the bristling pugnacity of the argument, the frequent personal attacks on members of the opposing faction, and the would-be cleverness of style detract very much from the value of the book as a helpful statement of the situation of behaviorism and psychology at the present time.

R. E. LEAMING

UNIVERSITY OF PENNSYLVANIA

PARKER, G. H. *Smell, Taste, and Allied Senses in the Vertebrates.* Philadelphia: Lippincott, 1922. Pp. 192.

The present is the sixth volume of Monographs on Experimental Biology, published under the editorship of Jacques Loeb, T. H. Morgan, and W. J. V. Osterhout. It is an excellent review of this field of biological investigation and knowledge. The hundred seventy-five pages of text are crowded with the condensed results of

a vast amount of research, and are no less valuable because the author has pointed out definitely the gaps in our knowledge as well as the established facts. The point of view of Dr. Parker is a dynamic one, structure and function being brought into intimate relations. The eight chapters deal with (1) the nature of sense organs; (2) the anatomy of the olfactory organ and the physiology of olfaction; (3) Jacobson's organ; (4) the common chemical sense; (5) the anatomy of the gustatory organ and the physiology of gustation; and (6) a consideration of the interrelations of the chemical senses.

Contrasting the older and the more recent views as to the nature of sense organs, Parker adopts the generic term "*receptor*," which he divides into "*activators*," when the receptors "are concerned purely and simply with the excitation of reflex acts and take no part in the production of sensations," and "*sense organs*" when "they are at the same time effective in arousing sensations, the elements of intellectual life." He regards receptors "as the original form of nervous structure, concerned in the beginning with the simple excitation of muscle (*activators*) and subsequently involved, after the development of the central organs, with that supply of impulses which yields the elements of the intellectual life (*sense organs*)." The structure and function of the chemical receptors, the organs of smell and of taste, are used to illustrate "the extent to which a natural group of receptors may undergo differentiation and yet maintain a striking degree of interdependence."

The gross and microscopic structure of the olfactory apparatus is set forth at length, with a balancing of the evidence *pro* and *con* regarding the nature of olfaction. The older view that the stimulus comes from material particles in a vaporous or gaseous condition is rejected and in its place the author accepts the newer view "that olfactory stimulation is dependent upon some form of solution." "That the material thus dissolved must act chemically on the olfactory receptors and not by means of any radiation that it may give out seems probable from the fact that olfactory stimuli are substances that are not known to be radio-active." "Many fishes scent their food much as air-breathing animals do and . . . they must be regarded as possessing powers of olfaction comparable with those of the higher forms." The exact organs of olfaction are the olfactory hairs which project into the coating of mucus that covers the olfactory membrane, they being at all times surrounded by this watery mucus, "which is in contact on its outer face with the air carrying the odorous particles," where the latter must be caught in great

numbers on the moist surface, and absorbed. Solubility of substances in *oil,* Parker thinks, is more important than solubility in *water* for olfactory stimulation. The lipoid character of the substance composing the olfactory hairs provides this solvent. This view is in accord with the established fact that a number of odorous substances are more soluble in lipoid than in water. The amount of a substance "necessary for olfaction even in the case of the least odorous . . . is very small and in that of the most odorous incredibly small," thus "mercaptan, a liquid with a penetrating garlic odor, could be recognized at a concentration of 1/23,000,000,000 of a milligram per cubic centimeter."

Keenness of scent varies widely in different species of animals in correlation with the form and extent of the olfactory area in the nasal cavity, so that animals may be grouped as *macrosmatic, microsmatic,* or *anosmatic.* The synthesis or neutralization of odors, or the analysis of compound odors into their components is, according to Parker, a function of the olfactory centers and not of the olfactory epithelium or of its receptors.

A short, but valuable, chapter is devoted to the vomero-nasal (Jacobson's) organ, its structure and its function. Perhaps no part of the nasal apparatus has been given more study than this, yet the part it plays, if any, in olfaction is not definitely determined. Parker inclines to the view that it is a subsidiary olfactory receptor though admitting that this conclusion is based more on our knowledge of its finer structure than upon experimental proof.

The *"common chemical sense"* is clearly distinguished by Parker and he recognizes "beyond a doubt that the effect of chemical irritants on the naturally moist skin of vertebrates is not to be ascribed to the stimulation of organs of touch or of pain but to some other form of receptor." "The curious feeling that comes from vapors that irritate the eyes, nose, or even the mouth, has not the remotest relation to touch, smell, or taste, and is only distantly suggestive of pain. Pain, however, is easily separated from the common chemical sense by the use of cocaine, and we are, therefore, entirely justified in concluding that the common chemical sense is a true sense with an independent set of receptors and a sensation quality entirely its own. In the fishes and amphibians it pervades the whole integument but in the reptiles, birds and mammals it is restricted to the partly exposed mucous membranes of the natural apertures, a restriction that doubtless arose as the vertebrate changed from an aquatic to an air-inhabiting form." The receptors for the common

chemical sense are found by Parker in the free nerve terminals of the spinal or cranial nerves. Mechanical stimulation and chemical stimulation are found "to apply to different sets of terminals and the exhaustion [experimentally] of one set does not involve that of the other."

The gustatory sense is extensively treated from the standpoints both of the structure of the gustatory apparatus and of its function. An interesting conclusion which Parker thinks "probable" is "that in mammals the trigeminal nerve, though suspected of including gustatory fibers, is really devoid of them. These fibers at most occur in the facial, glossopharyngeal and vagus nerves." It seems to the reviewer that this is a conclusion that should be subjected to further investigation, for it is certainly true that some of the fibers distributed to the distal third of the tongue have their proximate origin in the trigeminal, whatever may prove to be their ultimate source. Parker analyzes the location of taste and finds that the four tastes "have decidedly individual distributions on the tongue" of man, facts already familiar. "It is difficult," says Parker, and correctly enough, "to explain these differences in the distribution of the tastes except on the assumption of an independent sensory mechanism for each taste." He accepts "Müller's theory of the specific energy of sensory nerves as it is interpreted in modern physiology" and "the component theory as applied to taste." This position is sustained by observations of numerous investigators which show, for example, that "on treatment with cocaine the buccal sensations are extinguished in a definite order as follows: pain, bitter, sweet, saline, sour, and touch." Hence, "just as the sense of feeling in the skin has been shown to consist of at least four senses, touch, pain, heat, and cold, so taste must be regarded as . . . a generic term under which at least four true senses are gathered, sour, saline, bitter, and sweet." It is of some interest to note that "the sweet sense may be an exclusive possession of the higher vertebrates," since fishes apparently do not have it.

The final chapter on the interrelation of the chemical senses is a most useful summary of the facts on which Parker's conclusions are based. It is so concise and crammed so full of important matter that one is tempted to quote it entire! Much of material importance cannot be even mentioned here. After emphasizing the fact that "the conception of five senses for man is wholly inadequate, . . . and that the classes of human receptors are now known to be more

than twenty," Parker proceeds to a consideration of a basis for the classification of receptors in general and finds in the *stimulus* a more satisfactory means of discrimination between receptors than that afforded by *sensation*. Hence the recognition of three classes of receptors: *chemoreceptors, mechanicoreceptors,* and *radioreceptors*. The difficulties of this classification are due to the varying degrees of differentiation which the receptors have undergone during the evolution of the vertebrates, and are in kind the same difficulties which the taxonomic zoölogist encounters when he undertakes the classification of species. This problem is discussed in the last paragraphs of the book and in some respects represents the climax of interest for the reader. It is a field in which Parker is particularly at home and in which he has made many important contributions. He notes that "if the structure of the several vertebrate chemoreceptors is compared, it will be found that they present three types of organization," which he illustrates by diagrams. "When these three types are compared with the receptors of other animals, it is seen that the olfactory type reproduces almost exactly that found in the skins of many invertebrates." The common chemical receptors come next in the series and the gustatory type third; the last two are characteristic of vertebrates only. Within each type much detailed differentiation has taken place. "It is because of the repeated differentiations that characterize the evolutions not only of the chemoreceptors but of the other groups of like organs that a classification of them or even a simple enumeration proves to be so unsatisfactory. For they are not unitary elements that can be counted like the fingers on the hand, nor are they sufficiently coördinated to make classifications easy and natural. They are like the whole organism itself in that they exhibit that kind of diversity that characterizes evolutionary flux."

While sense organs have always excited general interest, it is the ear and the eye which have hitherto received the most attention. Psychologists, anatomists and neurobiologists, therefore, should welcome this study from the pen of one who is particularly well-equipped to produce it. The author has done his part well, and while he has not hesitated to state his own opinions and conclusions, he has not failed to note the points whereon differences of opinion still exist, or where further investigations are needed. The study is one that should incite other investigators to attack these problems with a zeal refreshed.

The publishers, likewise, have in the main done their part to give

the volume a worthy form, but the proof-reader has failed to note rather numerous typographical errors that are sometimes annoying though never serious enough to obscure the author's meaning.

H. H. LANE

UNIVERSITY OF KANSAS

1. SADGER, J. *Sleep Walking and Moon Walking.* (Trans. by L. Brink.) New York: Nerv. and Men. Dis. Pub. Co., 1920. Pp. x+140.
2. JELLIFFE, S. E., and BRINK, L. *Psychoanalysis and the Drama.* Washington: Nerv. and Men. Dis. Pub. Co., 1922. Pp. 162.
3. SAUSSURE, R. DE. *La Methode Psychoanalytique.* (Pref. by S. Freud.) Lausanne: Payott, 1922. Pp. iv+187.
4. REGIS, E., and HESNARD, A. *La Psychoanalyse des Nevroses et des Psychoses.* Paris: Alcan, 1922. Pp. xxii+404. 12 fr.
5. WHITE, H. W. *Demonism Verified and Analyzed.* Shanghai, China: Presbyterian Mission Press, 1922. Pp. v+155+vi.
6. MICKLEM, E. R. *Miracles and the New Psychology.* New York: Oxford University Press, 1922. Pp. 143. $2.50.
7. ROBBINS, A. M. *Past and Present with Mrs. Piper.* New York: Holt, 1921. Pp. vi+280.

1. Sadger's monograph contains a clinical section in which one case is given extensive consideration, 26 pages, and a few pages are devoted to each of seven other clinical cases. The literary section includes analyses of seven different literary productions as follows: *Aebelö* by S. Michaelis; *Jörn Uhl* by G. Frenssen, *Maria* by O. Ludwig, *Buschnovelle* by O. Ludwig, *Der Prinz von Homburg* by H. von Kleist, *Das Sündkind* by L. Anzengruber, *Macbeth* by Shakespeare. The whole monograph is a psychoanalytic study from which the conclusion is drawn that sleep walking represents "a motor outbreak of the unconscious" . . . "of a sexual erotic nature." The condition is to be found especially in a descendant of alcoholic epileptic, sadist, or hysteric with motor trend. Acceptance of the psychoanalytic interpretation is necessary if one wishes to follow all of the conclusions.

2. The monograph by Jelliffe and Brink is another psychoanalytic interpretation of literature. It includes the analysis of eight dramas: *Magic* by G. K. Chesterton, *Eyes of Youth* by C. Gliddens and M. Marcin, *Peter Ibbetsen* by J. N. Raphael from Du Maurier, *Redemption* by Leo Tolstoi, *The Army with Banners* by C. R. Kennedy, *The*

Willow Tree by J. H. Benrimo and G. C. Hazelton, *Dear Brutus* by J. M. Barrie, and *The Jest* by S. Benelli.

3. De Saussure's book has been given the approval of Freud as an exposition both of his hypotheses and the methods used in psychoanalysis. The book contains chapters on psychic activity, which deal with the unconscious, condensation, constellation, transfer, symbolism, sublimation, projection, etc.; infantile sexuality; the dream; distractions; the morbid symptom in psychoanalysis; an account of a dream; the interpretation of the dream; and a thirty-page account of the technique of psychoanalysis. The book closes with nine pages of conclusions which do not obviously differ from those which are contained in other psychoanalytic texts.

4. The work of Regis and Hesnard deals with the application of psychoanalysis in the neuroses and in the psychoses. Although the treatment is sympathetic in the main, there are many pages given over to criticism and the subject of psychoanalysis is dealt with perhaps more objectively than in most books of the kind. The book closes with a warning that psychoanalysis is not to be used indiscriminately, for it is asserted that with some individuals the effects are bad. There is a bibliography of the writings of Freud, another of the principal French works on psychoanalysis, and a third dealing with the principal contributions in foreign countries. Some of the titles appear to have been extracted from review journals and are translated into French. It is of interest to note that one of the most prolific writers on psychoanalysis in the United States (W. A. White) is represented by only one article, and many of our most recent American writers are not mentioned at all. In fact the bibliography which relates to America does not go beyond 1917.

5. Whether or not the book on demonism is to be taken as evidence of the inefficiency of science or the presence of enormous faith is not apparent. It is asserted that demons exist, that demonism is disassociation of a special character, of environmental origin, of morally evil quality, rooted in perverted religious beliefs and practices, and is essentially hypnotic. Reference to Freud and other writers on hysteria, to psychic researchers and others is curious in the face of the conclusion (p. 89) that "Satan is responsible for demonism," because "the lines of demarkation between countries which have no demonism and those which have it coincide with the limits of Christian influence," and "we know enough about Satan to justify the belief that he must have personality" (p. 115). The prevention of demonism must be (p. 54) true religion, which of course

must mean Christianity or perhaps especially that form of Christianity which is adhered to by the author.

6. The "new" psychology has many friends. It is once more invoked, this time in connection with the study of miracles. Some of these miracles are those of the Gospels and others are of more recent times, notably the World War. The cures have been accomplished by processes of suggestion and persuasion. For those who are interested there is an index with Biblical references.

7. It is impossible to review in a psychological journal a book of this character, which is obviously based not on science but on faith, and in which the terms used are not those which writers of scientific psychology utilize. For those who have belief in mediumistic phenomena the book will strongly appeal because it gives them moral support, it will not be of concern to the psychologist working in the laboratory, but to the psychoanalyst who can read character through literary productions it may be of interest, and it may be suggestive to the psychopathologist and the psychiatrist.

The seven books characterized above are not set down in order of psychological value. Each has its own special message to the professional psychologist. None is recommended for its outstanding psychological importance, all are recommended as examples of what some people believe are the only valuable aspects of present day mental science.

SHEPHERD IVORY FRANZ

EAGLETON, W. P. *Brain Abscess.* New York: Macmillan, 1922. Pp. xix+297.

This book is of importance mainly to surgeons. Psychologists who are interested in the mental disturbances associated with brain disease will find in it occasional remarks of value. Two appendices contain references to published cases of cerebellar abscess and frontal lobe abscess, some of which give facts which must be considered in dealing with nervous-mental relations.

S. I. F.

J. LINDWORSKY. *Methoden der Phantasieforschung, Methoden der Denkforschung.* (Abderhalden's Handbuch der Biologischen Arbeitsmethoden, Abt. VI, B. 2. Lieferung 56.) Pp. 54, 1922.

This is a review of the methods used by the authors enumerated below in investigating processes of imagination and processes of

thinking: Henseling, Segal, Philippe, Winch, Henning, Heilbronner, G. E. Müller, Jensch, Wingender, Joh. Müller, Perky, Stumpf, O. Gross, Ebbinghaus, Bühler, Rorschach, Weygandt, Heilbronner, Giroud, Lehmensick, Brandell, Moede, Hennig, Baerwald, Oelzell-Newin, Stern, Stählin, Margis, Orth, Clarke, Ach, Taylor, Kakise, Jacobson, Martin, T. V. Moore, Binet, Dürr, Messer, Michotte, Portych, Külpe, Pauli, Grünbaum, Koch, Habrich, Kuenburg, Achenbach, Seifert, Westphal, Mager, Schwiele, Aveling, Gemelli, Hollingworth, Störrung, Seltz, Read.

MAX F. MEYER

S. BEHN. *Psychologische Methoden der Traumforschung.* (Abderhalden's Handbuch der Biologischen Arbeitsmethoden, Abt. VI, B. 2, Lieferung 56.) Pp. 24, 1922.

The author distinguishes the following methods of dream investigation: the method of very weak stimulation; the method of suggestion and hypnosis; the method of well and in detail described dreams; the method of spontaneous awakening; the method of intentional awakening; the psychoanalytic method; the statistical method; comparison of the dreaming experience with the waking experience; comparison of the dream while falling asleep (Joh. Müller's "hypnagogic hallucination") with the dream while fully asleep; comparison of dreaming with insanity; comparison of dreaming with the waking experiences of criminals; the method of "folk psychology."

After briefly reviewing these methods and mentioning those who have used them, the author closes with a rather pessimistic (and, as is the present writer's opinion, for that very reason very sane and directive) paragraph, which is worth reading and of which we translate the last sentence: "In sciences more fortunate than psychology a concise statement of methods which have proved their value can lead onward to further fruitful labor, but in the contemporaneous psychology of dreaming the critic describing the methods that have been used must be very modest in his evaluation."

MAX F. MEYER

HOKE, R. E. *The Improvement of Speed and Accuracy in Typewriting.* Baltimore: Johns Hopkins Press, Studies in Education, No. 7. Pp. 42.

The problem of improving speed and accuracy in typewriting is divided into five parts: First, to investigate the frequency of the occurrence of the letters and marks in the English language; second, to investigate the number and distribution of errors made in actual typewriting, and to learn, if possible, their causes; third, to determine the relative abilities of the eight fingers and the two hands; fourth, to find the loads or burdens of work which the present typewriter keyboard places upon the fingers and hands; fifth, to attempt to enumerate the considerations which must be taken into account in the arrangement of a keyboard according to scientific principles, and to suggest an improved keyboard.

A scale of the frequency of the occurrence of letters and marks in the English language was determined by use of the Ayres spelling scale of the 1,000 commonest words in English writing, the 16th chapter of St. Mark, representative business letters, and current newspaper editorials. This work is all summarized in tables.

In order to find errors in typewriting and their causes, 500 full size pages of practice typewriting work were secured from about 100 different individuals and the errors found therein tabulated. The relationship between accuracy and frequency of use of letters is found to be very high. $r = .924$, P.E.$= .021$. A further study brings the author to the conclusion that there is no connection between accuracy and the combination of letters with which any one word may happen to be written. Also the position of the keys on the present keyboard exercises very little if any measurable effect upon accuracy.

Tapping tests were given to three separate groups of people to determine the relative abilities of the eight fingers and the two hands.

The finger and hand loads of the present typewriter keyboard are arrived at by using the frequency of occurrence of each letter and mark. It is found that the left hand carries a heavier load than the right which has an ability of approximately one-ninth more. Also, one or two fingers are carrying a very disproportionate load.

In the arrangement of an ideal keyboard, the loads on each finger are made as nearly as possible proportionate to their strength. The frequency of use of the letters and marks is made the basis for calculating the loads. From the pedagogical considerations, the most used letters are assigned to those keys most favorable from

the standpoint of accuracy; and vowels are assigned to the first fingers.

A figure is given showing the suggested rearrangement of the typewriter keyboard. The advantages of this arrangement are: (1) The back space, shift key and shift-lock are brought into a convenient position for operation by the thumb or first finger of either hand. (2) The entire keyboard can be operated without removing the hands from the position they take when the fingers are placed on the "home keys." (3) The interposition of the shift, shift-lock and back-spacer keys divides the keyboard into right and left halves, thereby tending to avoid errors and undesirable movements resulting from the encroachment of one hand on the territory of the other. (4) The interposed keys accentuate the importance, and make necessary, the confining of each hand to its appropriate bank of keys, with a minimum of movement. These four advanatages may be summed up by saying that this keyboard is definitely planned for the most accurate and economical operation by the touch method.

A bibliography of twenty-six titles is appended.

Dr. Hoke has done a good piece of work in this experiment, but has not taken full advantage of his data. Those conclusions that he draws from them are mostly well justified, but there are many places where his analysis is not complete. In particular, he is not thorough in his treatment of the relative abilities of the eight fingers (pp. 24–28). He makes no statistical comparison of the three groups, and does not draw the definite conclusions he later on (p. 29) assumes.

The question came into the mind of the reviewer as to the practicability of installing this new arrangement of the keyboard. The author has shown very clearly that it would have been better to have had our machines made in this way in the first place. He has not attempted to show that the gain in efficiency is sufficient to make up for the expense of the necessary changes.

The problem has been attacked in a logical way and adds another definite chapter to the work on fatigue and accuracy.

WARREN T. DAVIS

CARNEGIE INSTITUTE OF TECHNOLOGY

HOKE, E. R. *The Measurement of Achievement in Shorthand.* Baltimore: Johns Hopkins Press, Studies in Education, No. 6. Pp. 118+2 folders.

The measurement of achievement in shorthand has developed out of the movement for measuring, by use of scientifically constructed scales, the results of educational processes. The author gives a short summary of the reasons for using standardized tests and then presents his problem as the measuring of: (1) ability to read shorthand, (2) speed of writing shorthand, (3) the quality of the writing, and (4) the knowledge of the system.

Four tests and scales have been developed to measure these abilities in the Gregg System. The test for reading ability, A-1, is a combination of the Ebbinghaus completion method and the method of underscoring the right word to be substituted. The comprehension of the shorthand text is indicated in the reaction the subject makes in underscoring the alternative longhand words that occur in the blank spaces. Tests B-1 and B-2 are designed to measure speed of writing. Knowledge of the system, reading ability and speed of eye movements are reduced to a minimum by providing each line in the copy in longhand with the shorthand immediately under it and beneath both of these a space for the pupil to copy in shorthand. The validity and reliability of these two sets of tests are determined, but with only from forty to ninety-six cases.

A scale for determining the quality of shorthand penmanship has sixteen specimens with which is to be compared the person's writing of the same copy. Each specimen has a scale score. To measure the knowledge of the Gregg System a series of ten vocabulary tests has been devised. It is composed of the 1,000 commonest words (Ayres scale) and the 500 commonest phrases as determined in this experiment. Each test calls for 150 answers in shorthand to be set opposite as many words or phrases. After having scored 2,818 of these sets of ten tests, the author computed a scale for use of teachers in making their own tests. By use of this scale they can tell just what per cent of correct shorthand outlines they should expect from their classes.

There is a bibliography of forty-four references and the appendix gives the tests and scales in full.

With the exception of the section on the validity and reliability of the tests, the paper is very good. In this one place the author attempts

to prove his point by use of a small number of cases and inadequate criteria.

Dr. Hoke's work will stand as a landmark in the development of the teaching of shorthand.

WARREN T. DAVIS
CARNEGIE INSTITUTE OF TECHNOLOGY

EMERSON, W. R. P. *Nutrition and Growth in Children.* D. Appleton and Company, New York. 1922.

This is written by one who is well known for his work in ascertaining the causes of malnutrition. His "Class Method" for curing malnutrition has been gradually spreading over the country and this book serves as a rather popular explanation of the methods used. It is divided into three parts. Part I, The Diagnosis of Malnutrition; Part II, Malnutrition and the Home; Part III, A Nutrition Program for the Community.

The five chief causes of malnutrition, according to the present author, are, in the order of their importance: 1. Physical defects, especially nasopharyngeal obstructions; 2. Lack of home control; 3. Overfatigue; 4. Improper diet and faulty food habits; 5. Faulty health habits.

The essentials of health are: 1. The removal of physical defects; 2. Sufficient home control to insure good food and health habits; 3. The prevention of fatigue; 4. Proper food at regular and sufficiently frequent intervals; 5. Fresh air by day and night.

This book presents a clear idea of the practical problems of nutrition and those of the nutrition class. An appendix contains a facsimile of the record sheets used in the nutrition clinics as well as the weight-height tables which are based on the material of Boas and Burk, whose tables were arbitrarily pushed forward one half year. Emerson states "the basis of *weight for height* has proved to be an accurate measure of the condition of undernourished children, and in the many thousand cases that have come under my observation I have never found an instance in which it has proved to be impracticable."

The type of table used by Dr. Emerson, while approximately true for children under ten years of age, does not take into consideration the age factor for older children. For example, boys or girls of normal weight for height who are sixty inches tall at ten years of age weigh from 10 to 20 pounds less than boys or girls of the same height who are seventeen or eighteen years of age.

UNIVERSITY OF IOWA BIRD T. BALDWIN

HUNT, J. L., JOHNSON, B. J., LINCOLN, E. M. *Health Education and the Nutrition Class.* New York: Dutton, 1921.

This is a careful, thorough, and interesting account of the work done by the New York Bureau of Educational Experiments in the field of nutrition. It gives a frank presentation of the difficulties encountered, the mistakes made, and the methods used in overcoming the difficulties. The experiments were made in one public school which consisted primarily of Jewish children of a "crowded and unsightly" neighborhood. Those children who were 7 per cent or more underweight by the Burk-Boas Height-Weight-Age Tables were selected for the experiments. In general, the method of attack was that outlined by Dr. Emerson, who organized the work, but since the experiments covered a number of years the methods were modified later to suit the educational and research aspects of the problem. During the first year five classes were organized, but the last year more intensive work was done on the first grade children. Besides the physical examinations, correction of defects, open air classes, and mothers' meetings, a number of different types of mental examinations were made on the nutrition class and on a control group.

"It was decided to evaluate the nutrition group and the control group as to general intelligence rating, and to compare them in a few specific performances including a simple learning process, then to make a more intensive study of the types of responses made by the undernourished boys under varying forms of control." Some of the tests given are: Card Sorting, Cancellation, Action-Agent, Cylinders, Tapping, Target, Steadiness, Walking Board, Substitution, Ship Test. Moreover, scores for the Haggerty Mental Examination, the Intelligence Quotients by Stanford-Binet examinations, and the teachers' ratings were obtained from school authorities.

The authors do not consider these groups clearly enough differentiated from the standpoint of malnutrition to be representative ones for comparisons of the mental traits of the under-nourished child with those of well-nourished children.

The following causal factors of underweight, as given by the present authors differ somewhat from those given by Dr. Emerson: (a) diet; (b) hunger; (c) convalescences; (d) wasting diseases, such as syphilis, diabetes, chronic nephritis, malaria, etc.; (e) past history of chronic nutritional disorders or of diseases commonly resulting in impaired nutrition; (f) major defects; (g) undiagnosed conditions of disease and physiological facts as yet but little under-

stood must be anticipated as possible causal factors. Examples of these would be the part played in metabolism by the ductless glands, and that played by emotional disturbances.

BIRD T. BALDWIN

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C. DE MONTET & H. BERSOT. *Psychologie et Developpement de l'Enfance à la Vieillesse.* Berne: Bircher, 1922. Pp. 221.

While this book, as the title suggests, is a general study of psychological development from childhood to old age, it is essentially rather a study of the development of children's notions about money, and as such it is very interesting reading not only to the psychologist, but also to the sociologist, to the economist, to the teacher, and even to the linguist.

Children at the age from six to seven most commonly restrict themselves to saying about money (when asked) that with money one can buy things such as clothes, bread, milk, etc. Some children, having a limited literary ability, make such statements (given here in English—the originals are in French) as: Money serves our parents to eat us bread. With money one can make soup. Money serves to buy, borrow, lose, find, earn. A few answer the question about money but such indirect statements as: Mama has a silver bracelet. Of course, the fact that *argent* has a double meaning in French also leads to some confusion. One child, in order to report the fact which has impressed him most, makes the remark that "thieves steal money," without trying to make a more exhaustive statement.

What ought to strike the sociologist and teacher most is the fact that with advancing age the child, far from getting a more correct, scientific-economical notion of what money is, gets a more and more mystical notion of it. Even children at the age of eight, although they very naturally elaborate upon the buying power of money, begin to attribute all kinds of metaphysical-ethical "qualities" to it, and a theological student, 21 years old, hits the mark by evaporating money totally in such qualities. His essay, reprinted by the authors of the book, is worth reading.

"Money is *good* for us," is the answer of some eight to nine year old children to the authors' question: "What rôle does money play in the world?" "Money is bad," say others. Money kills. Silver is found in the mines. With money one can have a merry Christmas. One girl even asserts that "of silver one can make gold."

From ten to eleven years some children naturally merely repeat what younger children have to say. One writes laconically: "Money is dear and makes flour." The enumerations, where they persist, become varied. For money one can get dromedaries, airplanes, motor trucks. But the social life begins to show up in the answers. For the holidays mother spends much money, and sometimes she denies herself in order that we be happy. Money passes from hand to hand. A franc may travel all over Switzerland. Some people work hard and get little pay. A cent is not much, but one can buy a big piece of bread for it. If there was no money in the world, everybody would be a thief. Some use their money to get drunk and are put in prison. The distribution of money is not just; some have too much and some too little. Such are typical answers at this age.

At twelve years the fact of its ease of circulation is more frequently mentioned, but only by particular individuals who happen to be thus interested. The individuality of the writer becomes more and more pronounced. That one must borrow if he does not have it, is mentioned too. For the first time a writer states that *thus and so is merely his opinion.*

As already mentioned, with further advancing age the mystical powers of money impress the young folks more than its real powers. Let us give as an example an abstract from the writing of a sixteen year old boy. "Money is the thread which makes all the marionettes dance. The dollar is the universal king. It is one of the lashes with which civilization punishes itself. It makes half of our happiness. But it is also dangerous and may burn us.—O money, what a royal glory you are, and what a cesspool!"

A boy of eighteen advises us that "cherchez l'argent" is as much a part of wisdom as "cherchez la femme," whenever any question arises.

"Money plays an incalculable rôle in the world," we are taught by a nineteen year old girl. "For some it is an abyss into which they sink helplessly; for others it is a stimulus toward advancement."

The reviewer believes that the schools of the world which teach children history, geography and a lot of other things, might and ought to find also a little time to teach them what money is and what it is not. The author's study seems a valuable contribution toward that problem as soon as it is once conceived as a problem.

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F. C. PRESCOTT. *The Poetic Mind.* New York: Macmillan, 1922. Pp. 306.

This volume is an analysis of the mind of the poet and the mental circumstances favorable to the production of good poetry. Although not written by a professional psychologist the book is of most interest for its psychological subject matter and is well supplied with examples of poetry to support the theoretical discussion.

The fundamental contribution is the recognition of so-called undirected or autistic thinking as typically provocative of poetry. This autistic thinking may be found in the dreams of sleep and in the visions or phantasy of waking life. It is in the latter form of autistic thought that artistic creation finds its origin. The author makes an effective distinction between the extreme forms of directed and undirected thinking. Both forms of thought have their origin in an ungratified desire of some kind. Conscious interest, a problem, a task or purpose, is the conscious expression of the desire. Voluntary and directed thought serves to gratify a desire in a rather closely specified way. Undirected thought expresses in free imagination the gratified form of the desire. Imagination serves of course in both forms of thinking but in autistic thought it is free from the restrictions of environmental reality. Hence autistic thought is more clearly loaded with emotion while directed thought necessitates intellectual control in the expression of emotion or desire.

With this description of autistic thinking we agree as regards all creative thought. But the reviewer is not quite able to see what characterizes especially that form of autistic thinking that is called poetic. Autistic thought takes many forms which would not necessarily be called poetic.

The study of dreams has shown that the dream is always dramatized in the form of concrete images, usually visual. Dreams are free from abstractions except as these are dramatized in concrete form. Poetry is similar in nature. The universality of poetry is explained by showing that the unconscious, the feelings, are more universal than the particular forms by which they express themselves in rational thought. Poetry draws, as far as possible, from the mainsprings of human desire, the unconscious, the feelings. A state of mind approaching phantasy in its freedom is favorable to the expression of these feelings whereas a mental state of close concentration, reasoning about cause and effect and proof is unfavorable to poetic production. Poetry is in various ways shown to be the expres-

sion of feelings and desires which are for some repressed and which seek expression in concrete dramatized form in poetry.

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WARREN, H. C. *Elements of Human Psychology.* Boston: Houghton Mifflin Co., 1922. Pp. 416. $2.25.

The author says in the preface that "this book was written to meet numerous requests for an introductory textbook of psychology based on the functions of the nervous system. . . . Most of the theoretical discussions are omitted and the practical applications of psychology are emphasized." In the introductory chapter he defines psychology as "*the science which deals with the interaction between man and his environment by means of the nervous system and its terminal organs, together with the mental events which accompany this interplay.*" He criticizes untrained writers on the subject because they treat the mind as a simple unit. "They commence with the universe instead of the atom." At another place in the text he says: "It cannot be emphasized too strongly that the all-important fact in psychology is the creature's *response to the situation which confronts him.*" "*Consciousness*" is defined as a "characteristic of mental life." "The word itself is mysterious and forbidding." In a footnote he says: "Some psychologists get around the difficulty by dropping the notion of consciousness altogether and studying *behavior.* The result is a rather fragmentary science. It is like trying to study art and ignoring the notion of beauty."

Lists of "practical exercises" are appended at the end of each chapter. Most of these exercises are subjective—for instance: exercise 44 is, "Analyze your general state of feeling at three different times; *e.g.*, on waking, after a hearty meal, after a brisk walk." Review questions to assist the student in studying the text are appended at the end of the book. A glossary of psychological terms is combined with the index.

The book seems to be divided into two principal sections. Following the introductory chapter the next four chapters are devoted to a discussion of the nervous system and the senses. Six properties of the nerve substance are emphasized as being of special importance to a study of psychology. They are *excitation, conduction, retention, fatigue, collection,* and *distribution.* The nervous arc from receptor to effector "is composed of three sections: *sensory, central,* and *motor.* Corresponding to these there are three phases of activity

stimulation, adjustment, and *response.* The adjustment process is the most important of all. It includes *integration* of sensory impulses, and *coördination* of motor impulses." He does not, however, offer any mechanical explanation of how integration and coördination are brought about. Is it not well to offer the beginning student in any science a few theories and hypotheses to assist him in further study even though later discoveries may force a modification of them?

The remaining eleven chapters are headed respectively Conscious Life, Perception, Memory and Imagination, Feeling and Emotion, Instinct, Intelligence, Volition, Language and Thought, Mental Succession, Human Character, and Personality and Control.

Throughout the book the author prefers to speak of "mental" operations rather than of nervous processes, although he gives a table of what he considers fundamental conscious operations together with their corresponding nervous processes as follows:

Conscious Operation	*Nervous Operation*
Impression (sensibility)	Excitation
Suggestion (successive association)	Conduction
Revival (memory)	Retention
Attention (vividness, focusing)	Fatigue
Composition (simultaneous association)	Collection
Discrimination	Distribution
Transformation (mental chemistry)	Modification

Experiences are classified as fundamental and secondary.

FUNDAMENTAL

Experiences	*Dominating Component*
Perception	External Sensations
Imagery	External Ideas
Feeling	Systemic Sensations
Conation	Motor Sensations

SECONDARY

Experiences	*Dominating Components*
Emotion	Systemic and Motor Sensations
Sentiment	Ideas and Systemic Sensations
Volition	Ideas and Motor Sensations
Thought and Language (Social)	Ideas and Motor Sensations
Ideals	Ideas; Systemic and Motor Sensations

Many psychologists will agree with Mr. Warren that these "fundamental experiences" and "conscious operations" are not "universes," but some will also deny that they are "atoms."

He devotes about two pages to a discussion of conditioned reflexes. Although the principle of the conditioned reflex is an "atom" of great possibilities he does not take advantage of the opportunity offered by it to explain the slightly more involved acquired responses. He says "Our response to the dinner bell involves a more complex mental process and is not quite analogous to the dog's conditioned response."

He classifies learning, or habit formation, as (1) the formation of *mental* habits, and (2) the formation of *motor* habits. He says that both kinds of learning are essentially the same, "though the results differ." They involve two steps: (a) *acquisition*, and (b) *fixation*. In his discussion of *acquisition* he ignores the operation of the conditioned reflex principle. Rather he says: "There are at least three ways in which we form new paths: (1) One synapse may become *less resistant* to the passage of an impulse than it was before; or (2) the synapse that usually carries the impulse may become *very resistant*, so that its pathway is blocked and the impulse passes over into the next best path; or (3) a very intense impulse may succeed in breaking through *several synapses at once*, just as a powerful stream of water not only fills the usual channel but trickles over into other channels as well."

Not all readers of the book will be willing to admit that Mr. Warren has succeeded in writing a psychology based on the functions of the nervous system as he promised in the preface, nor will all of them admit that the practical applications have been emphasized. The psychology presented is distinctly subjective and structural throughout. Causal relationships, if not completely ignored, are given a very minor place.

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